



**BreezeLITE™**

## **User Manual**

SW Version 2.5  
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## Document Control

Topic	Description	Date Issued
The manual's first release.		Version 1.5, November 2005
Launching the application Section <a href="#">1.2</a>	Using the Base Station's alias to launch the application for that BST.	Version 2.0, March 2006
Graphic Display Section <a href="#">2.1</a>	New graphic display of the BST chassis.	Version 2.0, March 2006
Multi-Channels Sections <a href="#">2.2.1.2.3</a> , <a href="#">2.2.1.2.5</a> , <a href="#">2.2.1.4.3</a>	Support of Radio Cluster, ODU, and Channel entities.	Version 2.0, March 2006
Frequency Bands Section <a href="#">2.2.1.2.4</a>	Separating availability of radio bands (new HW) from SW releases.	Version 2.0, March 2006
Per Trap Configuration Sections <a href="#">2.2.1.2.6</a>	Per trap configuration of Admin Status, Severity and Suppression Interval	Version 2.0, March 2006
Cumulative Power On Time Sections <a href="#">2.2.1.3.1</a> , <a href="#">2.2.1.4.1</a> , <a href="#">2.2.2.1</a>	Display of the cumulative power on time for NPU and AU modules and for $\mu$ BST.	Version 2.0, March 2006
Backup Files Section <a href="#">2.2.1.3.3</a>	New backup files for filtering parameters and for trap configuration.	Version 2.0, March 2006
Performance Monitoring Sections <a href="#">2.2.1.3.5</a> , <a href="#">2.2.1.4.5</a> , <a href="#">2.2.2.5</a> , <a href="#">2.3.7</a>	Improved counters for NPU, AU, $\mu$ BST, and SU.	Version 2.0, March 2006
SU Service Fault Status Section <a href="#">2.3.1</a>	Indication of reason for service denial: Loop problem or SU Duplicate Name.	Version 2.0, March 2006
SU Estimated Distance Section <a href="#">2.3.3</a>	Displaying for each SU its estimated distance from the Base Station	Version 2.0, March 2006

Topic	Description	Date Issued
Filtering Chapter 6	Controlling traffic by forwarding/discarding packets according to a set of rules. Support of L2 and L3/L4 filters. Filtering is per interface (from either network or wireless side)	Version 2.0, March 2006
Deny List Section 6.2.3	Controlling traffic by discarding packets to/from specific MAC Addresses.	Version 2.0, March 2006
Hybrid VLAN Mode Section 5.9	Enabling classification of both tagged and untagged frames.	Version 2.0, March 2006
VLAN Transparency Mode Section 5.7	Defining the method of transferring packets to the operator's upstream network.	Version 2.0, March 2006
Bridge Aging Time Sections 2.2.1.3.1, 2.2.2.1	Option of No Aging Time (null entry) added.	Version 2.0, March 2006
Maximum Tx Power (dBm) Sections 2.2.1.2.5	A read-only display of the ODU maximum Tx power added.	Version 2.5, May 2006
SW Boot Version Sections 2.2.1.3.1, 2.2.2.1	A read-only display of the NPU/ $\mu$ BST SW boot version added.	Version 2.5, May 2006
Temperature Sections 2.2.1.3.1, 2.2.1.4.1, 2.2.2.1	Unit temperature indication added.	Version 2.5, May 2006
DRAP TTL Retries Sections 2.2.1.3.1, 2.2.2.1	Added feature.	Version 2.5, May 2006
SU Organization, Address, Country Section 2.3.1	SU Identifiers added.	Version 2.5, May 2006
Restore Traps Defaults section 2.2.1.2.6	Added feature.	Version 2.5, June 2006
License tab Sections 2.2.1.2.7	Added feature.	Version 2.5, June 2006

Topic	Description	Date Issued
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Default Service Section <a href="#">2.2.1.3.4</a>	Corrected functionality	Version 2.5, June 2006
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ODU Actual Frequency Band Section <a href="#">2.2.1.4.3</a>	Improved functionality-details of the actual band are displayed	Version 2.5, June 2006
Operator and Cell IDs in AU Air Interface tab Section <a href="#">2.2.1.4.4</a>	Added Current values of Operator ID and Cell ID	Version 2.5, June 2006
Data Port Counters in Micro Base Station Section <a href="#">2.2.2.5</a>	Added Data Port Counters	Version 2.5, June 2006
Add New SU Section <a href="#">2.3</a>	Added feature.	Version 2.5, June 2006
Installer Password Section <a href="#">2.3.1</a>	The Installer Password is configurable	Version 2.5, June 2006
SU Licenses Section <a href="#">2.3.1</a>	Added feature.	Version 2.5, June 2006
MAC Address Behind SU Section <a href="#">2.3.5</a>	Added feature	Version 2.5, June 2006
Downlink/Uplink Counters Section <a href="#">5.9.2</a>	QoS Profile parameters added. Counters description added.	Version 2.5, June 2006
Filtering Sections <a href="#">6.2.1.1</a> , <a href="#">6.2.1.2</a>	Filtering Rules in Micro Base Station updated	Version 2.5, June 2006

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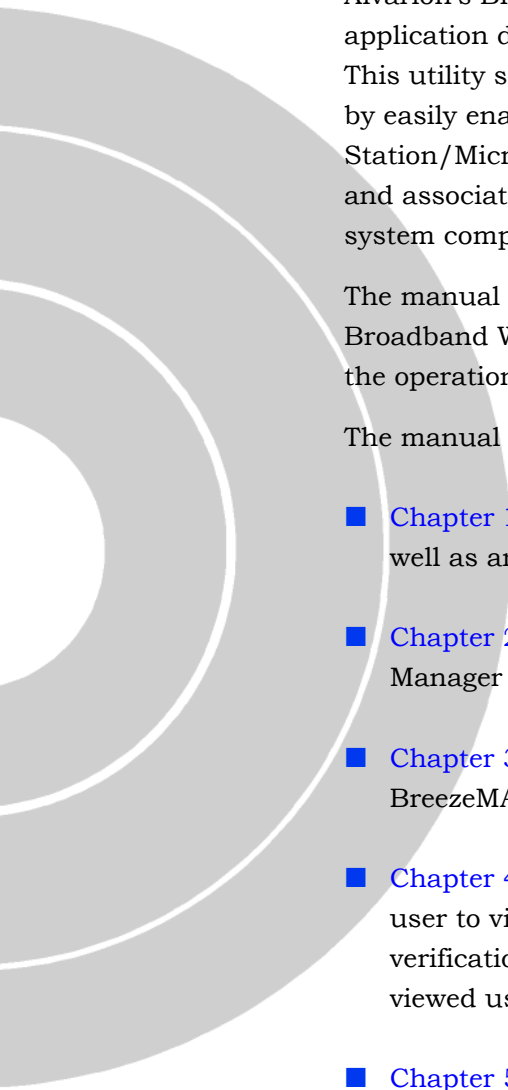
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# About This Manual



Alvarion's BreezeLITE is an SNMP (Simple Network Management Protocol) application designed for on-line management of BreezeMAX system components. This utility simplifies the installation and maintenance of small size installations by easily enabling the change of settings or firmware upgrade for one Base Station/Micro Base Station at a time (including the managed device's components and associated SUs) and collecting and viewing performance data from selected system components.

The manual is intended for personnel responsible for managing the BreezeMAX Broadband Wireless Access system. It is assumed that the reader is familiar with the operation and administration of BreezeMAX system components.

The manual includes the following chapters:

- **Chapter 1 - “Getting Started”**: Provides instructions for installing BreezeLITE as well as an overview of the BreezeLITE main window and its components.
- **Chapter 2 - “The Device Manager”**: Describes the functionality of the Device Manager with BreezeMAX devices, their components and the associated SUs.
- **Chapter 3 - “Software Upgrade”**: Describes the software upgrade process of BreezeMAX components.
- **Chapter 4 - “Monitoring”**: Describes the monitoring capabilities, allowing the user to view on-line information on link quality, SNR, etc. for performance verification and problem identification. The collected performance data can be viewed using a special Excel add-in.
- **Chapter 5 - “Services Provisioning”**: Describes the service provisioning process and how to configure the various service components.
- **Chapter 6 - “Filters”**: Describes the filtering definition process for controlling the traffic in the system by forwarding or discarding packets according to a set of rules based on multiple allow/deny criteria.





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## Chapter 1 - Getting Started

### In This Chapter:

- “Installing BreezeLITE” on page 2
- “Introducing the BreezeLITE Window” on page 3
- “The Configuration Window” on page 6

## 1.1 Installing BreezeLITE

The executable BreezeLITE file (SSetup.exe) is available in the CD package.

Run the executable file and follow the instructions to install the BreezeLITE utility on your PC.

The BreezeLITE utility comes with an MS Excel Add-In for easy manipulation of monitored data.



### To install the MS Excel Add-In:

- 1 Open MS Excel.
- 2 Select *Tools > Add-Ins*. The *Add-Ins* window is displayed.
- 3 Browse to the location of the Add-In file (BreezeLITE Monitoring.xla) and select the file.
- 4 Click **OK**. The Add-In is displayed in the list of MS Excel Add-Ins, and a new toolbar appears.



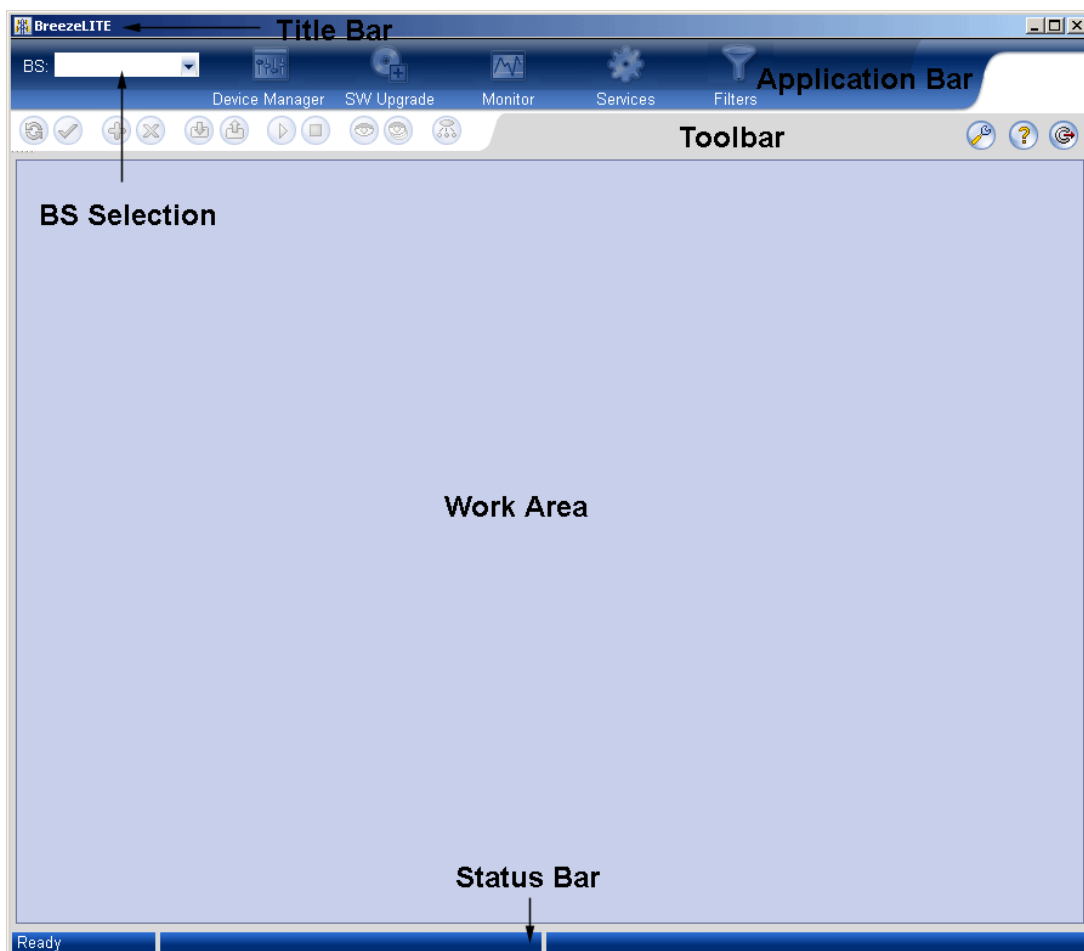
## 1.2 Introducing the BreezeLITE Window

The BreezeLITE main window enables to access a wide array of monitoring and configuration options, which are described in the following sections.



**To access the BreezeLITE main window:**

From the Windows *Start* menu, select **Programs** and then select **BreezeLITE**. Or, in the Command prompt, type: BreezeLITE <Base Station Alias> to launch BreezeLITE with a Base Station previously configured in the application. For information on adding base stations to the application and defining the alias refer to [Section 1.3.1](#). The *BreezeLITE Main* window is displayed, as shown below.



**Figure 1-1: BreezeLITE Main Window**

The *BreezeLITE Main* window comprises the following components:

- **Title Bar:** Identifies the application's name. It also includes standard icons for minimizing or closing the application.
- **BS Selection:** Identifies the Alias of the selected Base Station, and enables to select a different Base Station from the list.
- **Application Bar:** Enables access to the various BreezeLITE applications for configuration and monitoring of the selected Base Station. The BreezeLITE applications include the following:
  - ◇ **Device Manager** - for configuring system components of a selected Base Station (see [Chapter 2](#))
  - ◇ **SW Upgrade** - for upgrading the software version of NPUs, AUs, Micro Base Stations and SUs (see [Chapter 3](#))
  - ◇ **Monitor** - for performance monitoring and problem identification, (see [Chapter 4](#))
  - ◇ **Services** - for service provisioning (see [Chapter 5](#))
  - ◇ **Filters** - for defining filters (see [Chapter 6](#)).

**NOTE**

The applications become operational only after selecting a Base Station for configuration.

- **Toolbar:** The toolbar comprises the following buttons:



**Refresh:** Updates the information displayed in the window according to current values acquired from the unit.



**Apply:** Implements the modifications to the configuration. Exiting the configuration utility or switching to another application without applying discards the changes.



**Add:** Adds a new entry.



**Remove:** Removes a selected entry.



**Import IP List:** Imports an existing list of Base Station IPs (see [Section 1.3.3](#)).



**Export IP List:** Exports the list of IPs of Base Stations (see [Section 1.3.3](#))



**Start:** Operational in the SW Upgrade and Monitor applications only. Starts the SW upgrade/monitoring sessions.



**Stop:** Operational only in the SW Upgrade and Monitor applications or during Test All (see below). Terminates the SW Upgrade/Monitoring/Test All sessions.



**Test:** Checks the status of the selected Base Station (see [Section 1.3.4](#)).



**Test All:** Checks the status of all the listed Base Stations (see [Section 1.3.4](#)).



**Map:** Displays the BreezeMAX Multi-channel Definitions Provisioning diagram in the Device Manager application, and the Service Provisioning diagram in the Services Application, .



**Configuration Tool:** Opens the *Configuration* window. See [Section 1.3](#).



**About:** Displays the BreezeLITE's *About* window, showing the application's SW version.



**Exit:** Exits the application. Exiting BreezeLITE without applying the changes, discards the changes and closes the application.

- **Work Area:** The display of this area varies depending on the application. Refer to the relevant chapters for information on the actual display of this area:
- **Status Bar:** Displays information on the status of requested activity, including testing and monitoring cycle start time.

## 1.3 The Configuration Window

The *Configuration* window displays the list of Base Stations that can currently be managed by the configuration utility, and enables to manage it.



**To access the Configuration Window:**

Click on the **Configuration Tool** on the toolbar. The *Configuration* window is displayed.

Base Stations							Test Status Legend		
#	Alias	IP	Read community	Write community	Timeout (sec)	Test Status	Leds	Read	Write
1	Micro	11.11.11.13	public	private	30		●●	Fail	Fail
2	Modular	11.11.11.12	public	private	30		●●	Pass	Fail
3	NoAlias	11.11.11.14	public	private	30		●●	Fail	Pass
4	NoAlias-1	10.0.22.249	public	private	30		●●	Pass	Pass

**Figure 1-2: Configuration Window**

The list of Base Stations comprises the following parameters:

- #
- The row number. This number is automatically assigned to any new row. When a row is deleted, the rows are renumbered accordingly.

<i>Alias</i>	<p>An alias for the Base Station. The alias can be used for opening the BreezeLITE application with the relevant device selected.</p> <p>If no alias is provided, a default alias (NoAlias) is displayed. If several Base Stations are not provided with an alias, they will each receive a different distinctive number.</p> <p>It is recommended to define an alias to Base Stations to facilitate their selection from the list.</p>
<i>IP</i>	The IP address of the Base Station.
<i>Read Community</i>	An SNMP community string used by the configuration utility when sending an SNMP Get request to the selected Base Station.
<i>Write Community</i>	An SNMP community string used by the configuration utility when sending an SNMP Set request to the selected Base Station.
<i>Timeout (sec)</i>	Timeout for SNMP requests. If after a period of time there is no response from the Base Station, the request is timed out.
<i>Test Status</i>	Display the operational testing results of the Base Station (see <a href="#">Section 1.3.4</a> ).

At initial entry after installation, the list is empty. You will need to populate the list to manage your Base Stations.

From the *Configuration* window, you can:

- Add a Base Station to the list (see [Section 1.3.1](#)).
- Remove a Base Station from the list (see [Section 1.3.2](#)).
- Import a list of Base Stations from an existing file (see [Section 1.3.3](#)).
- Export the list of Base Stations as a file for backup (see [Section 1.3.3](#)).
- Test the Read and Write communities status of the Base Stations (see [Section 1.3.4](#)).

## 1.3.1 Add a Base Station



### To add a Base Station:

- 1 Click **Add** on the toolbar to add a line to the list.

- 2 Enter the IP address, Read/Write community strings, Timeout, and optionally an alias for the Base Station. If no alias is provided, a default alias (NoAlias) is displayed.
- 3 Click **Apply** to save the changes.



#### NOTE

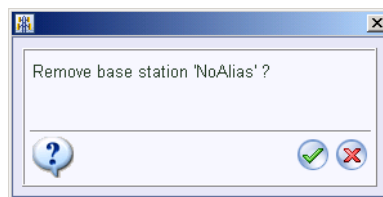
The list is automatically sorted according to the IP address.

## 1.3.2 Remove a Base Station



**To remove a Base Station:**

- 1 Select a Base Station from the list.
- 2 Click **Remove** on the toolbar. A confirmation message appears:



**Figure 1-3: Removing a Base Station Message**

- 3 Click **Yes** to confirm the removal. The selected Base Station is removed from the list.

## 1.3.3 Importing and Exporting IP Lists

You can backup your list of Base Stations with all the information displayed in the *Configuration* window. When required, you can import the list into the configuration utility of the same station or of other stations using BreezeLITE.



**To export an IP list:**

- 1 Click on **Export IP List** on the toolbar. The Windows *Save As* window is displayed.

- 2 Browse to the desired location, enter a name for the file and click **Save**. The file (.ipl) is stored in the selected folder.

**To import an existing list of IPs:**

- 1 Click on **Import IP List** on the toolbar. The Windows Select file window is displayed.
- 2 Browse to the folder where the file (.ipl) is stored and click **Open**. A confirmation message appears: "After this operation the current list will be deleted. Are you sure you want to import a new list?"
- 3 Click **Yes**, to import the list that will replace the current list, or **No** to cancel the request.

### 1.3.4 Test and Test All

You can check the status of the Read and Write communities of any selected Base Station or for all Base Stations.

**To test the communication status of the Read and Write communities:**

Click on **Communication Test/Communication Test all IP addresses** on the toolbar to test the communication status of a single selected Base Station or all listed Base Stations respectively. The status of the test is indicated in the Status bar. While the communication test is in progress, the status bar displays a blinking Testing message. When testing has completed, the Status bar should read Ready and the results are displayed in the Test Status column as two indicators: the left indicating the test result (pass/fail) for the Read community and the right the Write community.

A red indicator denotes a failed test and a green indicator a passed test.







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## Chapter 2 - The Device Manager



### In This Chapter:

- [“Using the Device Manager” on page 12](#)
- [“Base Station Configuration” on page 15](#)
- [“SU Configuration” on page 61](#)

## 2.1 Using the Device Manager

The Device Manager enables to manage and configure BreezeMAX system components in your network. The windows displayed vary depending on the type of selected Base Station (whether Modular or Micro Base Station). You can switch to any Base Station at any time.



### To access the Device Manager:

- 1 In the main window, select a Base Station from the list of Base Stations.
- 2 Click on the **Device Manager** icon on the Application Bar. The *Device Manager* window is displayed for the selected Base Station (whether Modular or Micro Base Station).

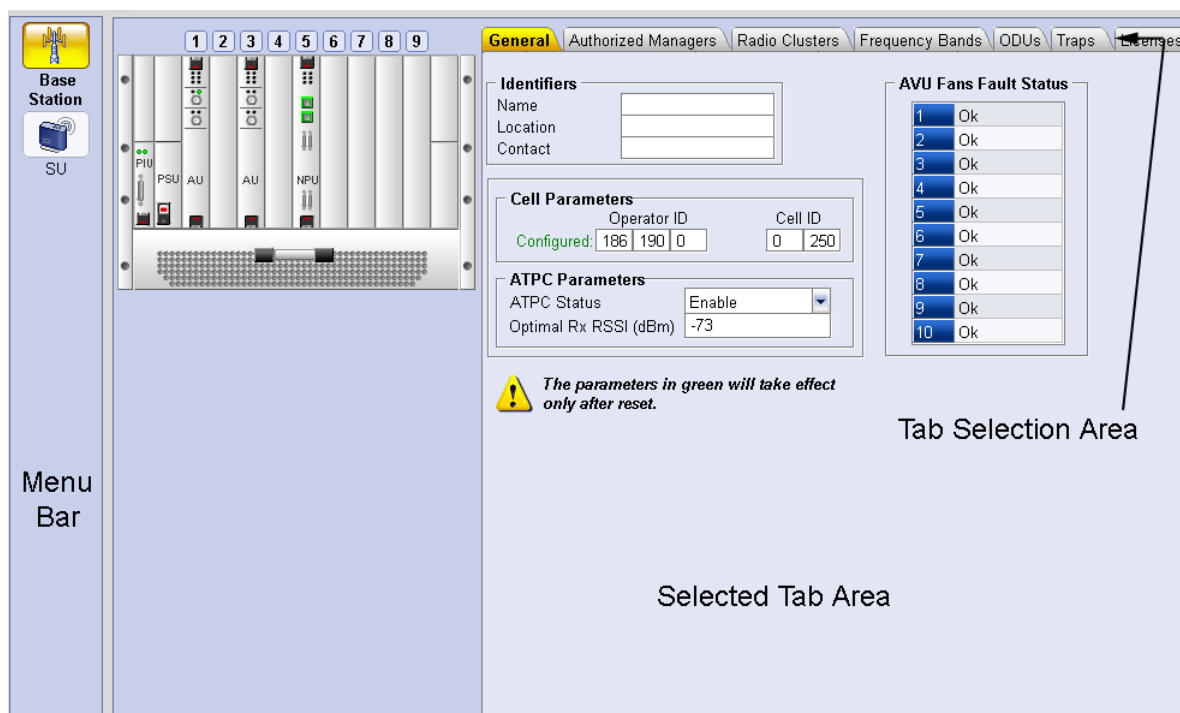
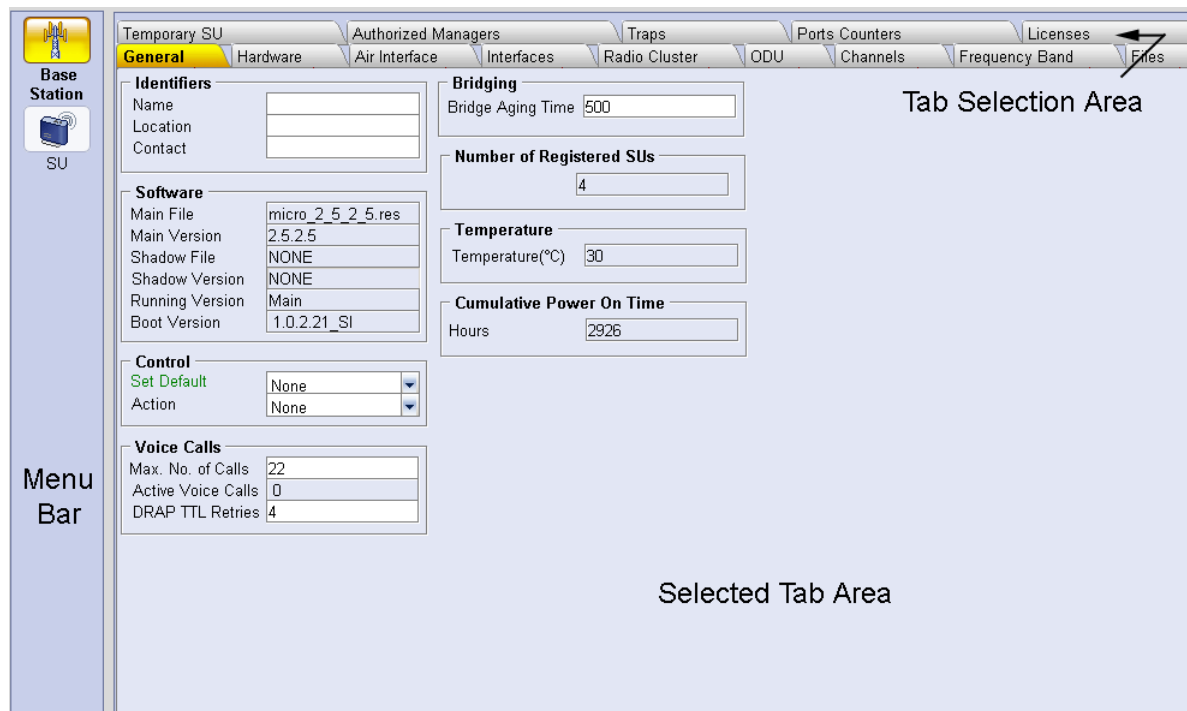


Figure 2-1: Device Manager Window - Modular Base Station



**Figure 2-2: Device Manager Window - Micro Base Station**

In addition to the components detailed in [Section 1.2](#), the work area of the Device Manager window includes the following components:

- **Menu Bar** - Includes two menu buttons: Base Station and SU. Clicking on them displays in the work area the Base Station view (whether Modular Base Station or Micro Base Station) and SU view respectively. The menu button's background changes to yellow, indicating the selected view.
- **Components Display Area**: Displays the components that can currently be managed by the configuration utility. In Base Station view, this is a graphic display of the Base Station chassis. In SU view, the units listed are all SUs associated with the Base Station. The Components Display area is not applicable to Micro Base Stations.

Components are selected from this list for management. To select a component for management, click on the component in the graphical display or from the SU list. The component is highlighted in yellow when selected. Information is then gathered from the unit and displayed in the Selected Tab Area.

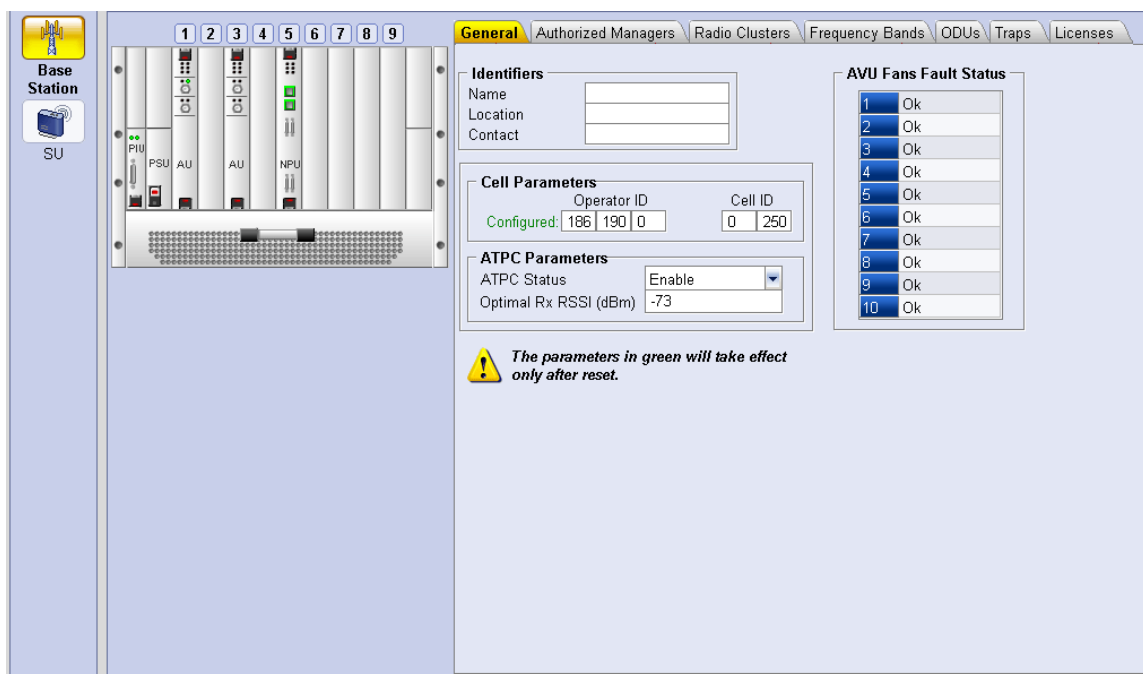
- **Tab Selection Area:** The Tab Selection Area comprises several tabs, each corresponding to a work area displaying a specific group of parameters. The tabs and the parameters displayed vary according to the selected unit type.
- **Selected Tab Area:** The Selected Tab Area is a workspace that varies according to the selected tab, enabling to view status or performance data and modify specific parameters. If no unit is selected, the Selected Tab Area displays the chassis view.

## 2.2 Base Station Configuration

The Base Station Device Manager windows vary depending on the selected Base Station for configuration: Modular Base Station or Micro Base Station. This section describes both types.

### 2.2.1 Modular Base Station

When accessing the Device Manager for a modular Base Station, the following window is displayed:



**Figure 2-3: Modular Base Station Configuration Window**

The Base Station Components List includes:

- “Chassis View,” [Section 2.2.1.1](#)

From the chassis view, you can select the component to be managed (NPU or AU). If no module is selected, you can manage the general parameters of the Base Station. See [Section 2.2.1.2](#).

- “Managing a Base Station,” [Section 2.2.1.2](#)

- “Managing an NPU,” [Section 2.2.1.3](#)

■ “Managing an AU,” Section 2.2.1.4

2.2.1.1 Chassis View

The Chassis View window shows a graphic display of the Base Station chassis (see Figure 2-3). The Chassis View is not applicable to Micro Base Stations.



NOTE

When clicking on Base Station on the Menu Bar, Chassis view is displayed by default. When a module is selected, the display changes to show the selected module’s parameters. To return to chassis view, click on **Base Station** in the Menu Bar.

The *Chassis View* allows to access the configuration windows for a selected module (NPU, AU) by clicking on the component in the graphic display (see Section 2.2.1.3 and Section 2.2.1.4). A faulty module is colored red.

2.2.1.2 Managing a Base Station


2.2.1.2.1 General Tab

The Modular Base Station *General* Tab enables to configure the Base Station identifiers, cell parameters and ATPC parameters:

**Identifiers**  
Name  
Location  
Contact

**Cell Parameters**  
Operator ID  
Cell ID  
Configured: 186 190 0 0 250

**ATPC Parameters**  
ATPC Status  
Optimal Rx RSSI (dBm)  
Enable  
-73

 The parameters in green will take effect only after reset.

**AVU Fans Fault Status**

1	Ok
2	Ok
3	Ok
4	Ok
5	Ok
6	Ok
7	Ok
8	Ok
9	Ok
10	Ok

Figure 2-4: Modular Base Station General Tab

Identifiers	
Name	The name of the Base Station. A string of up to 250 characters.
Location	The Location of the Base Station. A string of up to 250 characters.
Contact	The contact name. A string of up to 250 characters

**Cell Parameters**

<i>Configured Operator ID</i>	<p>A unique identifier of the network. The same Operator ID must be defined for all Base Stations/Micro Base Stations in the network, and it should not be used by any Base Station/Micro Base Station belonging to another network in the same area.</p> <p>The Operator ID consists of 3 groups of up to three digits each, where the range for each group is 0 to 255.</p> <p>The default Operator ID is 186.190.0.</p> <p>The Operator ID is defined for all AUs in the Base Station. Updated Operator ID is applied for each AU after resetting the AU, or after resetting the NPU, which causes reset of all AUs.</p>
<i>Configured Cell ID</i>	<p>A unique identifier of the Base Station. The same Cell ID should not be used by any other Base Station/Micro Base Station belonging to the network.</p> <p>The Cell ID consists of 2 groups of up to three digits each, where the range for each group is 0 to 255.</p> <p>The default Operator ID is 0.250.</p> <p>The Cell ID is defined for all AUs in the Base Station. Updated Operator ID is applied for each AU after resetting the AU, or after resetting the NPU, which causes reset of all AUs.</p>

**ATPC Parameters**

<i>ATPC Status</i>	<p>Controls whether the ATPC algorithm should be used to determine current optimal transmit level for each SU served by the Base Station.</p> <p>The default is Enable.</p> <p>The ATPC algorithm should always be enabled. The option to disable it is available to enable using a fixed rate to support certain tests. After each reset, the Base Station boots with the ATPC enabled, disregarding its status before the device was reset.</p>
<i>Optimal Rx RSSI (dBm)</i>	<p>The Optimal Uplink RSSI sets the target level at which all transmissions should be received by the AU-ODUs for optimal performance.</p> <p>The range is -103 to -60 (dBm).</p> <p>The default is -69 dBm.</p>

2.2.1.2.2 Authorized Managers Tab



NOTE

The following description is applicable for the Authorized Managers tabs in both a Modular Base Station and a Micro Base Station.

The *Authorized Managers* tab enables to define up to 10 management stations that are allowed to manage the Base Station, including all its components and the SUs associated with it.

To manage the Base Station, the management station running BreezeLITE must be defined as an authorized manager in the Base Station, with the applicable SNMP parameters properly configured. The management station can be defined as an authorized manager via the Monitor program or from another authorized manager.



NOTE

If no Authorized Manager is defined in the device, it can be managed using SNMP by any station. If at least one Authorized Manager is defined, the device can be managed only by a station whose parameters match a defined Authorized Manager.

#	IP	Read community	Write community	Traps
1	11.11.11.1	public	private	Enable
2	11.11.11.77	public	private	Enable
3	11.11.11.100	public	private	Enable
4	11.11.11.111	public	private	Enable

Figure 2-5: Authorized Managers Tab

The Authorized Managers tab includes a table displaying the current configuration status of all stations authorized to manage the Base Station, its components (NPU, AUs) and the associated SUs. The table includes the following fields for each authorized management station:

- #The row number (1-10). This number is automatically assigned for every new row. When an authorized management station is deleted, the rows are automatically renumbered.
- IPThe IP Address of the authorized management station.



<i>Read Community</i>	The SNMP Read Community string to be used by the authorized manager for read-only operations. The Read Community comprises a string of up to 23 case sensitive characters. The Read Community serves also as the Trap Community when the station is configured to receive traps. A null (empty) Read Community means that the Write Community is used also for Read (get) operations.
<i>Write Community</i>	The SNMP Write Community string to be used by the authorized manager for write/read operations. The Write Community comprises a string of up to 23 case sensitive characters. A null (empty) Write Community means that the station's access level is defined as read-only.
<i>Traps</i>	Enable or Disable sending traps to the management station.

From the *Authorized Managers* window you can:

- Add an authorized manager to the list of Authorized Managers.
- Edit the parameters of an existing authorized manager.
- Remove an authorized manager from the list.



#### To add an Authorized Manager:

- 1 Click on **Add** on the toolbar and enter the required parameters.
- 2 Click **Apply** to apply your changes. The IP is added to the list of authorized managers. The list is automatically sorted according to IP address.



#### To edit an Authorized Manager:

- 1 In the Authorized Managers table, double-click on a cell and enter the new information.
- 2 Click **Apply** to send the changes to the device.



#### To delete an Authorized Manager:

- 1 Select an authorized manager.

- 2 Click on Remove on the toolbar. A confirmation message is displayed: Remove IP '<IP Address>'?"
- 3 Click **Yes** to confirm. The selected IP is removed from the list of authorized managers.



#### IMPORTANT

Removing the management station running the configuration utility from the list of authorized managers will disable the remote management of the Base Station.

### 2.2.1.2.3 Radio Clusters Tab



#### NOTE

The following description is applicable for the Radio Clusters tabs in both a Modular Base Station and a Micro Base Station.

A Radio Cluster is a logical entity used to describe and support management of the Base Station's elements associated with specific geographical sectors. A Radio Cluster represents one or several ODUs that serve (through their directional antennas) the same geographical sector. Up to a maximum of six Radio Clusters can be defined per a modular Base Station, representing a cell coverage using 6 x 60° antennas. In a Micro Base Station, a maximum of four Radio Clusters can be defined.

The Radio Cluster(s) must be defined prior to defining the relevant ODU(s), AU(s) and Channel(s).

Radio Cluster				
#	Name	Location	Heading(deg.)	Beam Width(deg.)
1	au1	Location A	0	90
2	au2	Location B	0	90

**Figure 2-6: Radio Clusters Tab**

The *Radio Clusters* tab includes the following parameters:

#

A number used to identify the Radio Cluster. The Radio Cluster ID is configurable only when adding a new Radio Cluster.

The available values range from 1 to 6.

<i>Name</i>	<p>A string of up to 32 printable characters used as the descriptive name of the Radio Cluster. This is an optional descriptive parameter.</p> <p>The default is an empty string.</p>
<i>Location</i>	<p>A string of up to 255 printable characters used to describe the location of the Radio Cluster. This is an optional descriptive parameter.</p> <p>The default is the string defined as the Location parameter of the Base Station.</p>
<i>Heading (deg.)</i>	<p>The direction of the geographical sector, defined in degrees from the north. This is an optional descriptive parameter.</p> <p>The range is from 0 to 359 (degrees from north).</p> <p>The default value is 0 (degrees from north).</p>
<i>Beam Width (deg.)</i>	<p>The beam width, in degrees, of the antenna(s) used in the geographical sector. This is an optional descriptive parameter.</p> <p>The range is from 0 to 359 (degrees).</p> <p>The default value is 90 (degrees).</p>

From the *Radio Clusters* window you can:

- Add a radio cluster to the list.
- Edit the parameters of an existing radio cluster.
- Remove a radio cluster from the list.



#### To add a Radio Cluster:

- 1 Click on **Add** on the toolbar and enter the required parameters.
- 2 Click **Apply** to add the entry to the list.



#### To edit a Radio Cluster:

- 1 In the Radio Clusters table, double-click on a cell and enter the new information.
- 2 Click **Apply** to save the changes.



### To delete a Radio Cluster:

- 1 Select a row in the table.
- 2 Click on **Remove** on the toolbar. A confirmation message is displayed:  
“Remove Radio Cluster <Radio Cluster Name>?”
- 3 Click **Yes** to confirm. The selected Radio Cluster is deleted from the list.

#### 2.2.1.2.4 Frequency Bands Tab



#### NOTE

The following description is applicable for the Frequency Bands tabs in both a Modular Base Station and a Micro Base Station.

The *Frequency Bands* tab displays the list of available Frequency Bands.

File Version: 7

Name	Revision	Group ID	Start Freq (MHz)	Stop Freq (MHz)	Step (kHz)	Duplex Separation (MHz)
3.5A	A	1	3499.5	3553.5	125	-100
3.5B	A	1	3550	3600	125	-100
3.3F	A	2	3331	3360	125	50
3.3E	A	2	3316	3335	125	50
3.3G	A	3	3376	3400	125	-76
3.6A	A	9	3700	3753.5	125	-100
3.6B	A	9	3746.5	3800	125	-100

**Figure 2-7: Frequency Bands Tab**

The Frequency Bands Configuration file defines the characteristics of each of the frequency bands supported by the system. These characteristics include:

<i>File Version</i>	The version of the current Frequency Bands Configuration file.
<i>Name</i>	The name of the frequency band.
<i>Revision</i>	The revision of the frequency band.
<i>Group ID</i>	For certain bands, Channels belonging to the same AU/Micro Base Station may be configured to use different frequency bands, provided all the bands belong to the same group. The Group ID defines the Frequency Bands Group, which includes frequency bands that can be used by the same AU/Micro Base Station.
<i>Start Freq (MHz)</i>	The lowest downlink frequency
<i>Stop Freq (MHz)</i>	The highest downlink frequency

<i>Step (KHz)</i>	The increments (resolution in KHz) of the frequency.
<i>Duplex Separation (MHz)</i>	The difference between downlink (Tx) and uplink (Rx) frequencies.

### 2.2.1.2.5 ODUs Tab



#### NOTE

The following description is applicable for the ODUs tabs in both a Modular Base Station and a Micro Base Station.

The ODU(s) must be defined prior to defining the relevant AU(s) and Channel(s). The ODUs tab enables viewing the status and configuration details of existing ODUs, configuring the parameters of new ODUs including pre-configuration of ODUs that are not yet installed, updating the parameters of existing ODUs and deleting ODUs from the database

Upon first power-up of the modular Base Station, seven ODUs are defined automatically, with ODU IDs from 1 to 7. In the Micro Base Station, one ODU is defined automatically, with ODU ID 1. The parameters of these automatically created ODUs and their default values are:

- Associated Radio Cluster: NA
- Tx Power: 28 dBm
- ODU Configured Band: Not Defined
- Admin Status: Enabled

ID	Radio Cluster	Tx Power (dBm)	Admin Status	Configured Freq. Band	Operational Status
1	Clusret2	28	Enable	3.5A	Up
2	Clusret1	13	Enable	3.5A	Down
3	NA	28	Enable	3.5A	Down
4	NA	28	Enable	3.5A	Down
5	NA	28	Enable	3.5A	Down
6	NA	28	Enable	3.5A	Down
7	NA	28	Enable	3.5A	Down
8	Clusret2	34	Enable	3.5A	Unknown
9	Clusret2	13	Enable	3.5B	Down

Temperature (°C)	44
Maximum Tx Power (dBm)	28
Hardware Revision	1
Hardware Config Description	8
HC08 Version	9
CPLD Version	
Serial Number	Not Set

**Figure 2-8: ODUs Tab (Modular Base Station)**

The *ODUs* tab comprises two sections: ODUs table and the selected ODU's details. The ODUs table includes the following parameters:

*ID* A number used to identify the ODU. The ODU ID is configurable only when adding a new ODU.

The available values range from 1 to 24 for a Modular Base Station, or from 1 to 4 for a Micro Base Station.

*Radio Cluster* The ID of the associated Radio Cluster.

The available values range from 1 to 6 for a Modular Base Station, or from 1 to 4 in a Micro Base Station. The value must be that of an already defined Radio Cluster.

*Tx Power (dBm)* The Tx Power parameter defines the power level of the transmitted signal at the antenna port of the ODU.

The range is from 13 to 50 dBm using a 0.25 dBm resolution. In case the entered value is not compatible with the installed ODU, a trap will be issued. If the entered value is below the minimum supported by the ODU (currently applicable only for 3.6 GHz units where the minimum power is 18 dBm) the actual power will be set to the minimum supported by the unit. If the entered value is above the maximum supported by the ODU, the power will be changed to the maximum value supported by the ODU (28 dBm for a regular ODU, 34 dBm for a High Power ODU).

The default is 28 dBm.

*Admin Status* The transmit on/off status of the ODU.

The default option is Disabled.

<i>Configured Freq. Band</i>	<p>The Configured ODU Frequency Band will be modified through the use of Frequency Bands Configuration file. This mechanism allows adding new frequency bands without modifying the software by simply loading a new Frequency Bands File when the supporting hardware becomes available. The file will be either part of the NPU/Micro Base Station software or loaded later to the NPU/Micro Base Station.</p> <p>The Configured ODU Frequency Band can be updated only if the ODU is not associated with any Channel, or if the Admin Status of the associated Channel is Disabled.</p> <p>Compatibility between the Configured ODU Frequency Band and its actual band is verified by the AU/Micro Base Station upon attempting to associate the ODU with a Channel. If the Configured ODU Frequency Band differs from the actual band supported by the ODU, a mismatch trap will be sent by the AU/Micro Base Station upon attempting to associate it with a Channel and the association will be rejected.</p>
<i>Operational Status</i>	The operational status of the ODU (Up or Down).

For a selected ODU, the following parameters are displayed:

<i>Temperature (°C)</i>	The temperature (in degrees Celsius) of the ODU.
<i>Maximum Tx Power (dBm)</i>	The maximum Tx Power supported by the ODU. This read-only parameter sets the upper limit for the Tx Power parameter.
<i>Hardware Revision</i>	The ODU's Hardware revision.
<i>Hardware Config Description</i>	The ODU's Hardware configuration description
<i>HC08 Version</i>	The HC08 version.
<i>CPLD Version</i>	The CPLD version.
<i>Serial Number</i>	The ODU's serial number.

#### 2.2.1.2.6 Traps Tab



##### NOTE

The following description is applicable for the Traps tabs in both a Modular Base Station and a Micro Base Station.

The *Traps* tab enables viewing current parameters of all traps and updating the parameters of a selected trap.

ID	Name	Admin Status	Severity	Suppression Interval (sec)
0	ColdStart	Enable	Info	0
1	WarmStart	Enable	Info	0
2	LinkDown	Enable	Info	0
3	LinkUp	Enable	Info	0
4	AuthenticationFailure	Enable	Info	0
1	ResetOn	Enable	Info	0
2	DiagnosticsHwFaultOn	Enable	Major	0
3	DiagnosticsHwFaultOff	Enable	Info	0
4	MonitorAccessOn	Enable	Warning	0
5	MonitorAccessOff	Enable	Info	0
6	AuNetworkEntryStatus	Enable	Info	0
21	ShelfCardExtractionOn	Enable	Info	0
22	ShelfCardInsertionOn	Enable	Info	0
23	ShelfPeripheralEquipmentFau	Enable	Minor	0
24	ShelfPeripheralEquipmentFau	Enable	Info	0
25	ShelfEnvParamFaultOn	Enable	Info	0
26	ShelfEnvParamFaultOff	Enable	Info	0
41	ConfigurationChanged	Enable	Info	0
42	ParameterSetFailure	Enable	Info	0
50	MbstGraceLicense	Enable	Info	0
51	rbMbstCPEQuantityExceed	Enable	Info	0
52	rbLicenseFileLoadStatus	Enable	Info	0
61	OduCrcErrorOn	Enable	Warning	0
62	OduCrcErrorOff	Enable	Info	0
63	OduCommErrorOn	Enable	Minor	0

Figure 2-9: Traps Tab

The following information is displayed for each trap:

<i>ID</i>	The trap ID.
<i>Name</i>	The name of the trap.
<i>Admin Status</i>	The Admin Status of the trap. Double-click to edit.
<i>Severity</i>	The trap's severity. Double click to edit.
<i>Suppression Interval (sec)</i>	The minimum time (in seconds) between consecutive transmissions of the same trap. This parameter can be used to prevent excessive retransmissions of the same trap. Double click to edit.
	The available severities are Critical, Major, Minor, Warning and Info.
	The available values are from 1 to 86,400 seconds or 0 for no suppression, which is the default for all traps.

The three Restore to Default buttons on the top right side of the window can be used to restore the default values for all traps. Place the cursor on a button to view its functionality.



**To restore default values:**



Click on the button on the left side to restore the Admin Status of all traps to the default value (Enable for all traps).

Click on the button in the middle to restore the Severity of all traps to the default value.

Click on the button on the right side to restore the Suppression Interval of all traps to the default value (0 for no suppression).

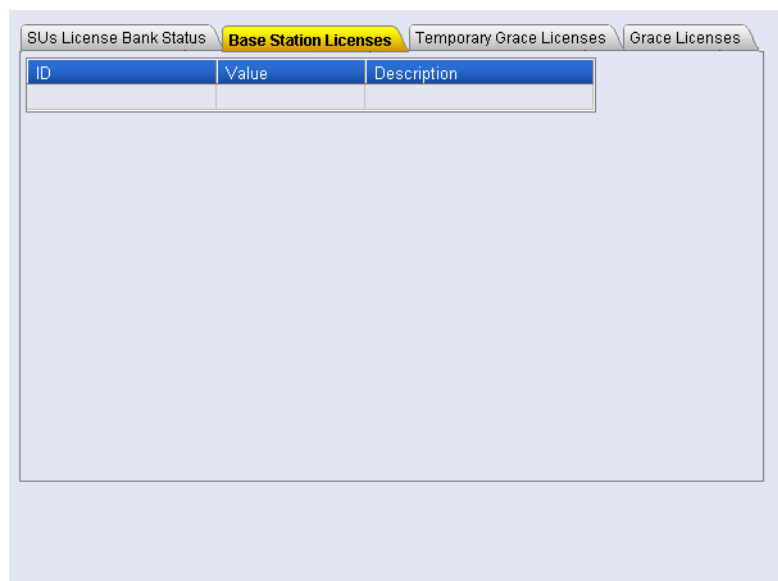
#### 2.2.1.2.7 Licenses Tab



##### NOTE

The following description is applicable for the Licenses tabs in both a Modular Base Station and a Micro Base Station.

The *Licenses* tab enables viewing information about the current status of Base Station and SUs licenses.



**Figure 2-10: Licenses Tab**

Four secondary tabs enables viewing the following details:

##### 2.2.1.2.7.1 SUs License Bank Status

Select this option to view a table with the current status of the SUs Licenses Bank (if available). For each entry, the following details are provided:

<i>ID</i>	The relevant license type. In the current version only a Bandwidth license type is available.
-----------	---

<i>Value</i>	The specific details of the relevant licenses. In the current version all Bandwidth licenses are Unlimited.
<i>Count</i>	The number of currently available licenses (balance). Each time a license is granted to a specific SU, the Count is decremented by one
<i>Description</i>	The descriptive name of the license.

#### 2.2.1.2.7.2 Base Station Licenses

Select this option to view a table with the current status of the Base Station Licenses (if available). For each entry, the following details are provided:

<i>ID</i>	The relevant license type. In the current version the following license types (IDs) are supported: <ul style="list-style-type: none"> <li>■ Bandwidth license.</li> <li>■ CPEs license (applicable only to a Micro Base Station that was upgraded from SW version 2.0 or lower)</li> </ul>
<i>Value</i>	The specific details of the relevant licenses. In the current version the available value are: <ul style="list-style-type: none"> <li>■ For the Bandwidth license: Unlimited, meaning that all relevant SUs associated with the Base Station will get unlimited bandwidth (up to 12 Mbps).</li> <li>■ For the CPEs (Micro Base Station): 50, 150 or 250, indicating the number of SUs that can be supported by the Micro Base Station.</li> </ul>
<i>Description</i>	The descriptive name of the license.



#### NOTE

In a Micro Base Station, a Value of "Grace" for Number of CPEs license (License ID = CPE), indicates that the number of CPEs served by a Micro Base Station with no CPE license has exceeded 20. A corresponding trap is sent. A grace period of 30 days is granted to the Micro Base Station, starting with the registration of the 21st CPE. During this grace period it can serve more 20 CPEs. When the grace period expires, the unit will be able to serve a maximum of 20 CPEs, and will reject any additional CPE that will try to associate with it.

The grace period is granted only to Micro Base Station that were upgraded from a SW version below 2.5, to provide sufficient time for purchasing and loading the necessary license.

#### 2.2.1.2.7.3 Temporary Grace Licenses

Select this option to view a table with the current status of the all Temporary Grace Licenses (if applicable).

The aggregate uplink and downlink MIR in all the services allocated to an L model (Limited) SU should not exceed 2 Mbps. If the aggregate MIR in the services assigned to such an SU exceeds this limit, the Network Service Provider has a 30

days grace period. During the grace period the assigned services are provided to the SU. At any time during the 30 days grace period the Network Service Operator can load to the SU the required permanent license for unlimited bandwidth. If a license was not loaded during this grace period, then during the first 3 days, defined as a temporary grace period, the Network Service Provider may change the services assigned to the SU so that the aggregate MIR is no longer above 2 Mbps. The SU will be removed from the list of Temporary Grace Licenses and will return to its previous status.

For each entry, the following details are provided:

<i>SU MAC Address</i>	The MAC address of the relevant SU.
<i>ID</i>	The relevant license type. In the current version only a Bandwidth license type is applicable.
<i>End Date</i>	The expiration date of the temporary grace period.

#### 2.2.1.2.7.4 Temporary Grace Licenses

Select this option to view a table with the current status of the all Grace Licenses (if applicable).

After expiry of the 3 days temporary grace period as described above, the SU is moved to the Grace Licenses list. After expiry of the full 30 days grace period, the SU is moved to a list of “Grace Period Expired” SUs (even if during the grace period the services assigned to them were changed so that the aggregate MIR is no longer above 2 Mbps). An SU that was moved to the Grace Period Expired list will remain in this list for 3 months. An SU that is included in this list cannot be granted another grace period. Any attempt to assign to it a service that will bring the aggregate MIR to a value above 2 Mbps will be rejected.

For each entry, the following details are provided:

<i>SU MAC Address</i>	The MAC address of the relevant SU.
<i>ID</i>	The relevant license type. In the current version only a Bandwidth license type is available.
<i>End Date</i>	The expiration date of the grace period.
<i>Status</i>	The status of the entry.

### 2.2.1.3 Managing an NPU

Base Station management, including all entities associated with it (modules and SUs) is performed via the NPU, which is the only entity that communicates directly with the management stations. NPU management includes all parameters

and operations that affect the NPU module only (although some operations may indirectly affect other components as well).



**To access the NPU Manager window:**

In *Chassis View*, click on the NPU. The NPU's slot number is highlighted in yellow and the *NPU Manager* window is displayed.

The *NPU Manager* window includes the following tabs:

- “NPU General Tab,” Section 2.2.1.3.1
- “NPU Interfaces Tab,” Section 2.2.1.3.2
- “Files Tab,” Section 2.2.1.3.3
- “Temporary SU Tab,” Section 2.2.1.3.4
- “NPU Ports Counters Tab,” Section 2.2.1.3.5

2.2.1.3.1 NPU General Tab

Identifiers

Name

Slot 5 NPU

Serial #

01

Status

Fault Status

No Faults

Software

Main File

npu\_2\_5\_2\_11

Main Version

2.5.2.11

Shadow File

npu\_2\_0\_1\_38

Shadow Version

2.0.1.38

Running Version

Main

Boot Version

1.0.1.59

Hardware

HW Version

2

HW Description

0

Control

Set Default

None

Action

None

Bridging

Bridge Aging Time

1400

Voice

DRAP TTL Retries

4

Temperature

Temperature(°C)

37

Cumulative Power On Time

Hours

1897

The parameters in green will take effect only after reset.

Figure 2-11: NPU General Tab

The NPU *General* tab comprises the following components:

Identifiers	
<i>Name</i>	A read-only display of the NPU's name. The default name assigned to the NPU by BreezeLITE is: Slot 5 NPU.
<i>Serial #</i>	A read-only display of the module's serial number.
Status	
<i>Status</i>	A read-only display of the module's operational status.
<i>Fault Status</i>	A read-only display of the module's fault status.
Software	
<i>Main File</i>	The name of the main file. Every time the NPU resets, it will reboot using the file defined as Main.
<i>Main Version</i>	A read-only display of the main SW version.
<i>Shadow File</i>	The name of the shadow SW file. Typically, the Shadow file is the backup file. Every time a new SW File is downloaded to the NPU, it is stored as a Shadow file, replacing the previous Shadow file.
<i>Shadow Version</i>	A read-only display of the shadow SW version.

<i>Running Version</i>	A read-only display of the running SW version (Main or Shadow).
<i>Boot Version</i>	A read-only display of the SW boot version.

#### Hardware

<i>HW Version</i>	A read-only display of the NPU HW version.
<i>HW Description</i>	A read-only display of the NPU HW description.

#### Control

<i>Set Default</i>	<p>Enables to revert all NPU parameters to factory default.</p> <p><b>WARNING</b> - Setting the parameters of the NPU to their default values will disable remote management of the Base Station and may result in loss of connectivity.</p>
<i>Action</i>	A drop-down menu enabling to select the SW versions control operation to be executed by the NPU. The possible actions are: None, Reset, Run from Shadow, Set as Main.

#### Bridging

<i>Bridge Aging Time</i>	The aging time for all addresses in the Forwarding Data Base. The available values are from 1 to 1440 minutes or null for no aging.
--------------------------	---

#### Voice

<i>DRAP TTL Retries</i>	<p>The limit of TTL retries for gateways that support the DRAP protocol before concluding that the gateway is no longer active and removing it from the database. The TTL retry time (the maximum time between two consecutive Allocation Requests) is 255 seconds.</p> <p>The range is from 1 to 100.</p> <p>The default is 4.</p> <p><b>Note</b> - During SW download to a gateway, which may take up to almost 15 minutes under worst conditions, the DRAP protocol is not active. If the gateway is removed from the database before SW download is completed, the download process will fail. During SW download, the DRAP TTL Retries parameter should be set to its default value of 4 (equivalent to 17 minutes).</p>
-------------------------	---

#### Temperature

<i>Temperature (°C)</i>	A read-only display of the NPU's temperature.
-------------------------	---

#### Cumulative Power On Time

<i>Hours</i>	The cumulative power-on time of the NPU since first power-up.
--------------	---

2.2.1.3.2 NPU Interfaces Tab

The NPU *Interfaces* tab enables to view and configure parameters that affect the operation of the Data and Management Ethernet ports.

**Data Port**  
IP Address1.1.1.3  
Subnet Mask255.255.255.0  
Default Gateway0.0.0.0  
Management VLAN ID4095None  
Operational StatusDown  
Configured Link SpeedFull Duplex 100Mbps

**Management Port**  
IP Address10.0.1.81  
Subnet Mask255.255.255.0  
Default Gateway10.0.1.29  
Network Destination128.0.0.0  
Network Dest. Mask128.0.0.0  
Operational StatusUp  
Link Speed100Mbps


 The parameters in green will take effect only after reset.

Figure 2-12: NPU Interfaces Tab

The NPU *Interfaces* tab comprises the following components (fields in green are accepted only after reset):

Data Port	
IP Address	The IP address of the Data Port.
Subnet Mask	The IP subnet mask for the Data port.
Default Gateway	The default Gateway IP address for the Data port.
Management VLAN ID	The VLAN ID for management frames. If a value between 0 and 4094 is configured for the Management VLAN ID, the device will accept management frames only if their VLAN tag has the identical value. A value of 4095 means No VLAN. Enter 4095 or select the <b>None</b> check box to accept all management frames regardless of their VLAN tag (No VLAN).
Operational Status	A read only display of the port operational status (Up or Down).
Link Speed	The link speed: Full Duplex 100Mbps or 1 Gbps.
Management Port	
IP Address	The IP address of the Management Port
<b>CAUTION:</b> Do not configure the IP Address of the Management port to 0.0.0.0, as this will cause loss of management connectivity via the DATA port.	

<i>Subnet Mask</i>	The IP subnet mask for the Management port.
<i>Default Gateway</i>	The default Gateway IP address for the Management port.
<i>Network Destination &amp; Network Dest. Mask</i>	These two parameters define the IP subnet of stations that can manage the device when connected through a router to the Management port. All management frames destined for addresses belonging to this group will be routed via the Management port. All management frames destined for other addresses will be routed via the Data port.
<i>Operational Status</i>	A read only display of the port operational status (Up or Down).
<i>Link Speed</i>	A read only display of the current link speed and duplex (the Management port operates always in Auto Negotiation mode).

**NOTE**

- The NPU can be managed either In Band (IB) via the Data port or Out Of Band (OOB) via the Management port. It is highly recommended to use the Management port for local management only. Typically the port should be down (disconnected).
- The IP Addresses of the Data and Management ports must belong to different subnets.
- If a Default Gateway is specified for the Management port (an address other than the 0.0.0.0 default, which means "no default gateway"), network destination parameters must be defined as well. The network destination subnet must be different from both the Data port and the Management port subnets.

**CAUTION**

Changing the parameters of the port used for remote management may result in loss of connectivity and may disable remote management of the Base Station.

### 2.2.1.3.3 Files Tab

**NOTE**

The following description is applicable for the Files tabs in both a Modular Base Station and a Micro Base Station.

Up to three AU SW files and three SU SW files may be stored in an NPU. In a Micro Base Station, up to 3 SU SW files may be stored. When three SW files of a certain type (AU or SU) are stored in the NPU/Micro Base Station, a new file cannot be loaded until at least one of the existing files is deleted. The *Files* tab enables to view the current AU and SU SW files stored in the NPU/Micro Base Station and to delete selected file(s). It also enables instructing the NPU/Micro Base Station to create a backup file of the configuration parameters for the entire Base Station and its components.



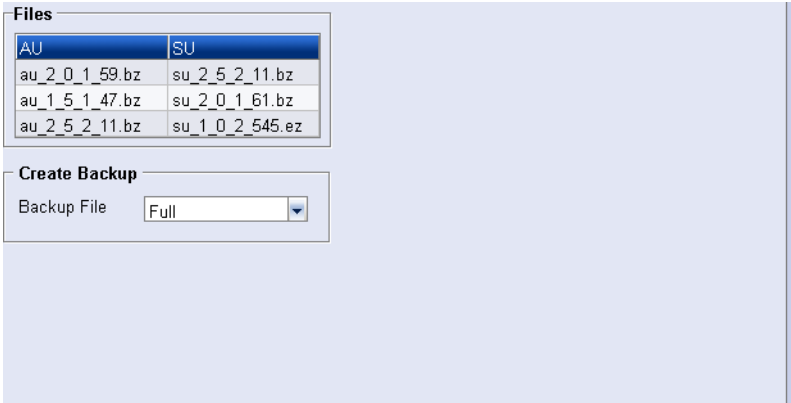


Figure 2-13: Files Tab (NPU)

The *Files* tab includes the following components:

Files	
<i>AU (not applicable for a Micro Base Station)</i>	A read-only list of up to 3 AU SW file names.
<i>SU</i>	A read-only list of up to 3 SU SW file names.
Create Backup	
<i>Backup File</i>	<p>The Create Backup option enables creating backup files of the Base Station configuration. The backup file contains copies of all the applicable configuration files and databases in the system.</p> <p>The following options are available:</p> <ul style="list-style-type: none"><li>■ None: No backup file will be created.</li><li>■ Full: The entire Base Station configuration (excluding Passwords and basic IP parameters of the MGMT and DATA ports - IP Address, Subnet Mask and Default Gateway). The default file name is backup.res.</li><li>■ Profiles: All the profiles associated with services (Service Profiles, Forwarding Rules, Priority Classifiers, QoS Profiles). The default file name is profiles.res.</li><li>■ Profiles and Services: All the profiles and configurations associated with service (General Service parameters, Subscribers, Services, Service Profiles, Forwarding Rules, Priority Classifiers, QoS Profiles). The default file name is profiles_srvcs.res.</li></ul>

Backup File (Cont.)

- Filtering: All the configurations of Filtering Rules, Interface Filtering and Deny List. The default file name is filtering.res.
- Traps: The configuration parameters for all traps. The default file name is traps\_config.res.

2.2.1.3.4 Temporary SU Tab



NOTE

The following description is applicable for the Temporary SU tabs in both a Modular Base Station and a Micro Base Station.

The *Temporary SU* tab enables to define the Default SU File and Default Action. The Default SU File is loaded to any new temporary SU when the Base Station operates in Quick mode in order to provide to it the defined Default Service(s). The Default Action is the action(s) to be performed with the Default File.

In addition, the tab enables to define the Service Mode (Quick or Advanced), and the Default Services that will be available to temporary SUs in Quick Service Mode.

<b>Control</b>	
Default File	su 2 5 2 6.bz
Default Action	None
<b>Default Service</b>	
Service Mode	Quick
Service Profile ( Type L2 )	Prof13
Service Profile ( Type PPPoE )	None
Service Profile ( Type Voice )	None

Figure 2-14: Temporary SUs Tab

The *Temporary SU* tab includes the following components:

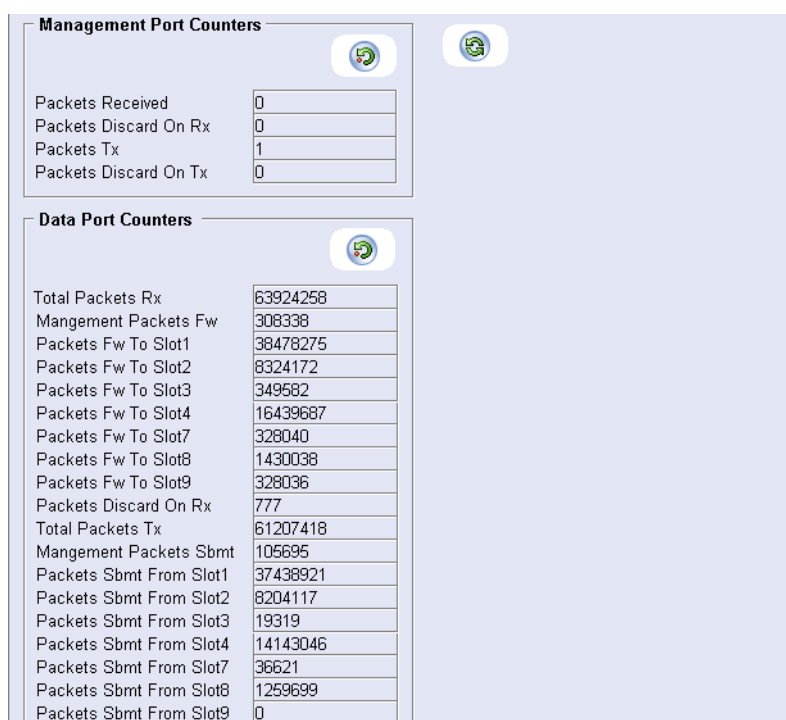
Control	
Default File	The name of SU SW File that will serve as the Default File for new temporary SUs, selectable from a drop-down menu displaying the SU SW files in the NPU/Micro Base Station.
Default Action	A drop-down menu enabling to select the operation to be executed with the selected default SU SW file when a new temporary SU joins the cell when operating in Quick Mode. The possible actions are: None, Put to Shadow, Run from Shadow, Set as Main.

### Default Service

<i>Service Mode</i>	Enables to set the service mode for temporary SUs: Quick or Advanced. When the service mode is set to Quick, a temporary SU will receive services based on the defined service profiles. The combination of L2 and Voice Service Profiles is not allowed. When set to Advanced, a temporary SU will not receive any services.
<i>Service Profile (Type L2)</i>	A drop-down menu of L2 service profiles for temporary SUs. To set an L2 service profile, the Voice service profile must be None.
<i>Service Profile (Type PPPoE)</i>	A drop-down menu of PPPoE service profiles for temporary SUs.
<i>Service Profile (Type Voice)</i>	A drop-down menu of Voice service profiles for temporary SUs. To set a Voice service profile, the L2 service profile must be None.

### 2.2.1.3.5 NPU Ports Counters Tab

The *NPU Ports Counters* tab enables to view and reset the NPU Ethernet Ports counters.



The screenshot displays the 'NPU Ports Counters' interface. It is divided into two main sections: 'Management Port Counters' and 'Data Port Counters'. Each section has a reset button (a circular arrow icon). The 'Management Port Counters' section shows four counters: Packets Received (0), Packets Discard On Rx (0), Packets Tx (1), and Packets Discard On Tx (0). The 'Data Port Counters' section shows a larger list of counters, including Total Packets Rx (63924258), Management Packets Fw (308338), Packets Fw To Slot1 (38478275), Packets Fw To Slot2 (8324172), Packets Fw To Slot3 (349582), Packets Fw To Slot4 (16439687), Packets Fw To Slot7 (328040), Packets Fw To Slot8 (1430038), Packets Fw To Slot9 (328036), Packets Discard On Rx (777), Total Packets Tx (61207418), Management Packets Sbmt (105695), Packets Sbmt From Slot1 (37438921), Packets Sbmt From Slot2 (8204117), Packets Sbmt From Slot3 (19319), Packets Sbmt From Slot4 (14143046), Packets Sbmt From Slot7 (36621), Packets Sbmt From Slot8 (1259699), and Packets Sbmt From Slot9 (0).

Management Port Counters	
Packets Received	0
Packets Discard On Rx	0
Packets Tx	1
Packets Discard On Tx	0

Data Port Counters	
Total Packets Rx	63924258
Management Packets Fw	308338
Packets Fw To Slot1	38478275
Packets Fw To Slot2	8324172
Packets Fw To Slot3	349582
Packets Fw To Slot4	16439687
Packets Fw To Slot7	328040
Packets Fw To Slot8	1430038
Packets Fw To Slot9	328036
Packets Discard On Rx	777
Total Packets Tx	61207418
Management Packets Sbmt	105695
Packets Sbmt From Slot1	37438921
Packets Sbmt From Slot2	8204117
Packets Sbmt From Slot3	19319
Packets Sbmt From Slot4	14143046
Packets Sbmt From Slot7	36621
Packets Sbmt From Slot8	1259699
Packets Sbmt From Slot9	0

**Figure 2-15: NPU Ports Counters Tab**

The *NPU Ports Counters* tab displays the Data (DATA) and Management (MGMT) ports counters and enables to reset them. The information displayed for each counter is the accumulated number since the last time the counters were reset.

The counters are reset each time the NPU is reset, or upon activating the Reset Counters option.

The displayed counters include:

#### **Management Port Counters**

<i>Packets Received</i>	The total number of packets received on the interface. Packets with errors are not counted.
<i>Packets Discard On Rx</i>	Packets received from the Management port that were discarded.
<i>Packets Tx</i>	The total number of packets transmitted to the interface. Packets with errors are not counted.
<i>Packets Discard On Tx</i>	Packets transmitted to the Management port that were discarded.

#### **Data Port Counters**

<i>Total Packets Rx</i>	The total number of packets received on the interface. Packets with errors are not counted.
<i>Management Packets Fw</i>	The total number of management packets (packets whose destination is the NPU, and broadcasts) received on the Data port and forwarded to the NPU's internal management.
<i>Packets Fw To Slot1</i>	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 1.
<i>Packets Fw To Slot2</i>	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 2.
<i>Packets Fw To Slot3</i>	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 3.
<i>Packets Fw To Slot4</i>	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 4.
<i>Packets Fw To Slot7</i>	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 7.
<i>Packets Fw To Slot8</i>	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 8.
<i>Packets Fw To Slot9</i>	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 9.
<i>Packets Discard On Rx</i>	Packets received from the Data port that were discarded due to switching and classification failures.
<i>Total Packets Tx</i>	The total number of packets transmitted to the interface. Packets with errors are not counted.
<i>Management Packets Sbmt</i>	The total number of management packets submitted by the NPU.

<i>Packets Sbm From Slot1</i>	The total number of packets received by the NPU from the AU in Slot 1 and submitted to the Data port.
<i>Packets Sbm From Slot2</i>	The total number of packets received by the NPU from the AU in Slot 2 and submitted to the Data port.
<i>Packets Sbm From Slot3</i>	The total number of packets received by the NPU from the AU in Slot 3 and submitted to the Data port.
<i>Packets Sbm From Slot4</i>	The total number of packets received by the NPU from the AU in Slot 4 and submitted to the Data port.
<i>Packets Sbm From Slot7</i>	The total number of packets received by the NPU from the AU in Slot 7 and submitted to the Data port.
<i>Packets Sbm From Slot8</i>	The total number of packets received by the NPU from the AU in Slot 8 and submitted to the Data port.
<i>Packets Sbm From Slot9</i>	The total number of packets received by the NPU from the AU in Slot 9 and submitted to the Data port.

The NPU *Ports Counters* tab also includes the following buttons:



Refresh counters



Reset counters

## 2.2.1.4 Managing an AU



**To access the AU Manager window:**

In *Chassis View*, click on the AU to be managed. The slot number is highlighted in yellow. The *AU Manager* window is displayed.

The *AU Manager* window includes the following tabs:

- “AU General Tab,” Section 2.2.1.4.1
- “AU Hardware Tab,” Section 2.2.1.4.2
- “Channels Tab,” Section 2.2.1.4.3
- “AU Air Interface Tab,” Section 2.2.1.4.4
- “AU Ports Counters Tab,” Section 2.2.1.4.5

2.2.1.4.1 AU General Tab

**Identifiers**  
Name Slot 1 AU

**Status**  
Status Up  
Fault Status No Faults

**Software**  
Main File au\_2\_5\_2\_11.bz  
Main Version 2.5.2.11  
Shadow File au\_2\_5\_2\_10.bz  
Shadow Version 2.5.2.10  
Running Version Main

**Voice Calls**  
Max. No. of Calls 50  
Active Voice Calls 0

**Control**  
Set Default None  
Action None

**Number of Registered SUs**  
12

**IDU Temperature**  
Temperature(°C) 34

**Cumulative Power On Time**  
Hours 3787


 The parameters in green will take effect only after reset.

Figure 2-16: AU General Tab

The AU *General* tab comprises the following components:

Identifiers	
Name	A read-only display of the AU's name. The default name assigned to the AU by BreezeLITE is: Slot # AU, where # stands for the actual slot number.
Status	
Status	A read-only display of the module's operational status.
Fault Status	A read-only display of the module's fault status.
Software	
Main File	The name of the main file. This name does not necessarily include clear identification of the SW version number. Every time the AU resets, it will reboot using the file defined as Main.
Main Version	A read-only display of the main SW version.
Shadow File	The name of the shadow SW file. Typically, the Shadow file is the backup file. Every time a new SW File is downloaded to the AU, it is stored as a Shadow file, replacing the previous Shadow file.
Shadow Version	A read-only display of the shadow SW version.
Running Version	A read-only display of the running SW version.

**Voice Calls**

*Max No. of Calls*                      The maximum number of simultaneous voice calls that can be supported by the AU.

The range is between 0 and 300.

*Active Voice Calls*                      The number of currently active voice calls handled by the AU.

**Control**

*Set Default*                              Enables to revert all AU parameters to factory default.

*Action*                                      A drop-down menu enabling to select the SW versions control operation to be executed by the AU. The possible actions are: None, Reset, Run from Shadow, Set as Main.

**Number of Registered SUs**

A read-only display of the number of SUs registered to the selected AU.

**IDU Temperature**

*Temperature (°C)*                      A read-only display of the AU-IDU's temperature.

**Cumulative Power On Time**

*Hours*                                      A read-only display of the cumulative power-on time of the selected AU since first power-up.

2.2.1.4.2 AU Hardware Tab

The AU *Hardware* tab includes read-only details on the versions of the AU IDU.

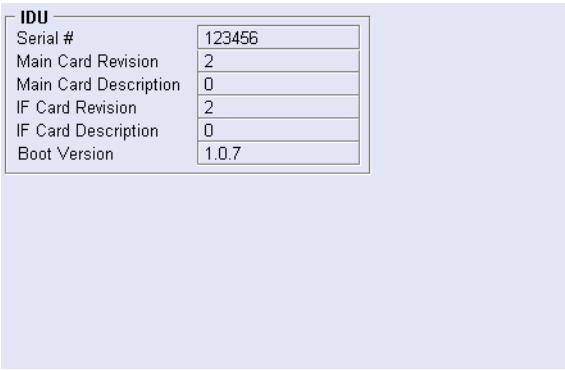


Figure 2-17: AU Hardware Tab

The AU *Hardware* tab includes the following components:

IDU	
<i>Serial #</i>	A read-only display of the IDU serial number.
<i>Main Card Revision</i>	A read-only display of the main card's revision.
<i>Main Card Description</i>	A read-only display of the main card's description.
<i>IF Card Revision</i>	A read-only display of the IF card's revision.
<i>IF Card Description</i>	A read-only display of the IF card's description.
<i>Boot Version</i>	A read-only display of the IDU boot version.



### 2.2.1.4.3 Channels Tab

Each AU/Micro Base Station can include up to 4 Channels. In the current release only AUs/Micro Base Stations with 2 Channels are available. Each channel can be connected to an ODU.

ID	ODU ID	Configured Tx Frequency (MHz)	Admin Status	Operational Status
1	1	3510	Enable	Up
2	3	3545	Enable	Up
3	NA	3580.875	Disable	N/A
4	NA	3580.875	Disable	N/A

Radio Cluster

cluster1

Tx Frequency (MHz)

3510

Rx Frequency (MHz)

3410

ODU Tx Power (dBm)

28

ODU Actual Frequency Band

Name

NA

Revision

NA

Group ID

NA

Start Frequency (MHz)

NA

Stop Frequency (MHz)

NA

Step Frequency (MHz)

NA

Duplex Separation (MHz)

NA

**Figure 2-18: Channels Tab (AU)**

The *Channels* tab includes the following options:

<i>ID</i>	The channel ID (1-4)
<i>ODU ID</i>	The ODU ID (1-24 in a Modular Base station, 1-6 in a Micro Base Station) of the associated ODU.
<i>Configured Tx Frequency (MHz)</i>	<p>The Tx frequency in MHz, which must be in accordance with the selected Bandwidth and the rules defined in the Frequency Bands File for the frequency band selected as the Configured ODU Frequency Band of the associated ODU.</p> <p>After configuring the Downlink Frequencies f1 for an one of the AU's/Micro Base Station's Channels, the Downlink Frequencies for other Channels of the same AU/Micro Base Station should be configured using increments of +/- 0.875 MHz from the defined frequency: <math>f1 \pm (N \times 0.875)</math>.</p> <p>The Downlink Frequencies of all Channels of the same AU/Micro Base Station should belong to the same Frequency Bands Group</p>

<i>Admin Status</i>	<p>The Admin Status must be disabled to enable changes in the Configured ODU Frequency Band of an associated ODU. If the Configured ODU Frequency Band differs from the actual band supported by the ODU, a mismatch trap will be sent by the AU/Micro Base Station upon trying to associate it with a Channel and the association will be rejected.</p> <p>The Admin Status of all Channels belonging to the same AU/Micro Base Station must be disabled to enable a configuration change in the Bandwidth parameter.</p>
<i>Operational Status</i>	The operational status of the ODU: Up/Down.

The *Channels* tab also displays the following read-only parameters for the selected channel:

<i>Radio Cluster</i>	The associated radio cluster as configured in the Associated ODU.
<i>Tx Frequency (MHz)</i>	The downlink frequency in MHz.
<i>Rx Frequency (MHz)</i>	The uplink frequency in MHz, computed from the configured Downlink (Tx) Frequency according to the Duplex Separation of the applicable Frequency Band.
<i>ODU Tx Power (dBm)</i>	The Tx Power of the Associated ODU

In addition, the parameters of the actual frequency band of the ODU are shown:

#### ODU Actual Frequency Band

<i>Name</i>	The Configured ODU Frequency Band.
<i>Revision</i>	The revision of the ODU Frequency Band.
<i>Group ID</i>	For certain bands, Channels belonging to the same AU/Micro Base Station may be configured to use different frequency bands, provided all the bands belong to the same group. The Group ID defines the Frequency Bands Group, which includes frequency bands that can be used by the same AU/Micro Base Station.
<i>Start/Stop Frequency (MHz)</i>	Set the boundaries of the Frequency Band.
<i>Step Frequency (MHz)</i>	The increments (in MHz) of the Frequencies.
<i>Duplex Separation (MHz)</i>	The difference between downlink (Tx) and uplink (Rx) frequencies.

Note that due to a configuration mistake the actual ODU frequency band may differ from the configured frequency band. The discrepancy will be detected only upon trying to enable the Admin Status of the Channel connected to the ODU. In this case the Admin Status of the Channel cannot be disabled.

2.2.1.4.4 AU Air Interface Tab

The AU *Air Interface* tab enables to view and configure parameters that affect the wireless link. The parameters in green will take effect only after reset.

MAC Parameters

Operator ID

1861900

Cell ID

0250

Current Sector ID

206

Configured Sector ID

0

Max. Cell Radius (km)

20

Current ARQ Status

Disabled

Configured ARQ Status

Disabled

Multi Rate

Support

Enabled

UL Basic Rate

BPSK 1/2

DL Basic Rate

BPSK 1/2

Bandwidth (MHz)

Current

1.75

Configured

3.5


 The parameters in green will take effect only after reset.

Figure 2-19: AU Air Interface Tab

The AU *Air Interface* tab comprises the following components:

MAC Parameters	
Operator ID	<div>A read-only display of the current Operator ID.  The Operator ID is defined for all AUs in the Base Station General tab (See <a href="#">Section 2.2.1.2.1</a>). Updated Operator ID is applied for each AU after resetting the AU, or after resetting the NPU, which causes reset of all AUs.</div>
Cell ID	<div>A read-only display of the current Cell ID.  The Cell ID is defined for all AUs in the Base Station General tab (See <a href="#">Section 2.2.1.2.1</a>). Updated Cell ID is applied for each AU after resetting the AU, or after resetting the NPU, which causes reset of all AUs</div>
Sector ID (Current/Configured)	<div>The Sector ID parameter consists of three digits in the range of 0 to 255.  The default Sector ID is 206.</div>

<i>Max. Cell Radius (km)</i>	<p>The Maximum Cell Radius is used to adapt various timing parameters of the MAC to the time it takes a message to reach its destination. This time delay is dependent upon the distance between the originating and receiving units. The timing parameters should be adapted to the largest expected delay, which is determined from the distance from the AU of the farthest SU served by it.</p> <p>For Non-Line-Of-Sight (NLOS) links using refractions, the cell distance should be higher than the line-of-sight distance. Typically a 10% margin is a good estimate for the increase in distance due to the NLOS operation.</p> <p>The basic time element (symbol) used by the system is 68 microseconds. This symbol size is translated to a round trip delay of approximately 20 km, or a cell radius of 10 km. Thus, it is recommended to set the Maximum Cell Radius using a resolution of 10 km: the actual timing of the system is the same for any cell radius larger than <math>N \times 10</math> km and smaller than or equal to <math>(N+1) \times 10</math>.</p> <p>An SU located at a distance larger than the Maximum Cell Radius will be rejected during the network entry process.</p> <p>The values range is from 10 to 110 km. Use 10 km increments (10, 20, ....110).</p> <p>The default is 20 km.</p>
<i>ARQ Status (Current/Configured)</i>	<p>The ARQ Enable/Disable parameter controls whether to use an ARQ algorithm for detecting errors and requesting retransmissions of applicable unicast messages (applicable only for Best Effort and Non Real Time services).</p> <p>The default is Disable.</p>

**Multi Rate**

<i>Support</i>	<p>The Multirate Support parameter controls whether or not the multirate algorithm will be used to determine current optimal rates in both the uplinks and downlinks. Typically, the multirate algorithm should always be enabled. The Disable option enables using a fixed rate, and is intended to support special tests. After each reset, the AU boots with Multirate Support enabled, disregarding its status before the device was reset.</p>
<i>UL/DL Basic Rate</i>	<p>These parameters define the Basic Rate for the uplink and downlink (see <a href="#">Table 2-1</a>). The Basic Rate is the minimum rate to be used by the Multirate algorithm. This is also the rate to be used for downlink broadcasts and multicasts. In the uplink, this is the rate to be used by SUs for non-scheduled transmissions, such as during the contention period. The Basic Rate is also the initial rate to be used by the algorithm for each new SU that joins the cell when the Multirate algorithm is enabled.</p>

Bandwidth (MHz)	
<i>Current/Configured</i>	<p>The frequency bandwidth used by the radio. A change in the Bandwidth parameter will take effect only after resetting the AU.</p> <p>The Admin Status of all Channels belonging to the same AU must be disabled to enable a configuration change in the Bandwidth parameter.</p> <p>The available options are 1.75 MHz and 3.5 MHz.</p> <p>The default is 3.5 MHz.</p>

2.2.1.4.5 AU Ports Counters Tab

The AU *Ports Counters* tab enables to view and reset the AU Ethernet Ports counters.

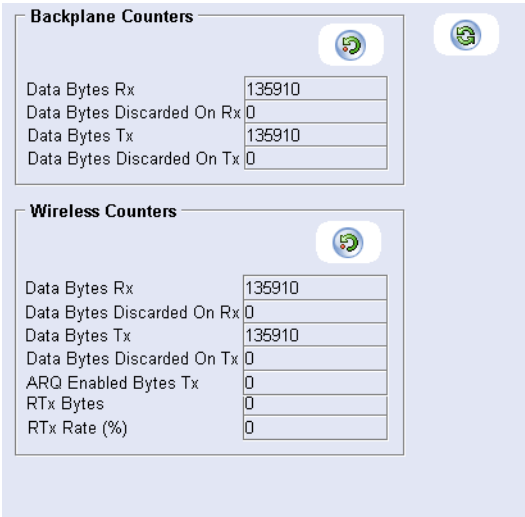


Figure 2-20: AU Ports Counters Tab

The AU *Ports Counters* tab enables viewing or resetting the Backplane and Wireless ports counters. The information displayed for each counter is the accumulated number since the last time the counters were reset. The counters are reset each time the AU is reset, or upon activating the Reset option.

The displayed counters include:

Backplane Counters	
<i>Data Bytes Rx</i>	The total number of data bytes received from the Backplane (NPU). Management frames and frames with errors are not included.

<i>Data Bytes Discard on Rx</i>	The number of bytes in packets discarded due to communication errors between the AU and the NPU.
<i>Data Bytes Tx</i>	The total number of data bytes transmitted to the Backplane (NPU). Management frames and frames with errors are not included.
<i>Data Bytes Discard on Tx</i>	This count is always 0 (No discards).

**Wireless Counters**

<i>Data Bytes Rx</i>	The total number of data bytes received from the Wireless link. MAC management frames and frames with errors are not included.
<i>Data Bytes Discard on Rx</i>	The number of bytes in packets received from the Wireless link and discarded due to MAC protocol receive errors, such as duplicate sequence number, wrong sequence number etc. (not CRC errors).
<i>Data Bytes Tx</i>	The total number of data bytes transmitted to the Wireless link. MAC Management frames and frames with errors are not included.
<i>Data Bytes Discard on Tx</i>	The number of bytes in packets discarded due to congestion in the wireless medium.
<i>ARQ Enabled Bytes Tx</i>	The number of bytes transmitted over BE and NRT connections. Applicable only if the ARQ mechanism is enabled.
<i>RTx Bytes</i>	The number of unacknowledged bytes that were retransmitted. Retransmissions are applicable only to BE and NRT connections provided the ARQ mechanism is enabled.
<i>RTx Rate (%)</i>	Retransmission Rate in percents is defined as:  $100 * (\text{Bytes Retransmitted}) / (\text{ARQ Enabled Bytes Transmitted})$ .

The AU *Ports Counters* tab also includes the following buttons:



Refresh counters



Reset counters

## 2.2.2 Micro Base Station

When accessing the Device Manager for a Micro Base Station (μBST), the following window is displayed:

**Figure 2-21: Micro Base Station Configuration Window**

The *Micro Base Station Configuration* window includes the following tabs:

- “Micro Base Station General Tab,” Section 2.2.2.1
- “Micro Base Station Hardware Tab,” Section 2.2.2.2
- “Micro Base Station Air Interface Tab,” Section 2.2.2.3
- “Micro Base Station Interfaces Tab,” Section 2.2.2.4
- “Micro Base Station Ports Counters Tab,” Section 2.2.2.5



### NOTE

Some Micro Base Station tabs are identical or very similar to Modular Base Station/NPU/AU tabs. These tabs are described in the applicable sections of the Modular Base Station management, as indicated below.

- “Authorized Managers Tab,” Section 2.2.1.2.2
- “Radio Clusters Tab,” Section 2.2.1.2.3
- “Frequency Bands Tab,” Section 2.2.1.2.4
- “ODUs Tab,” Section 2.2.1.2.5
- “Traps Tab,” Section 2.2.1.2.6
- “Licenses Tab,” Section 2.2.1.2.7
- “Files Tab,” Section 2.2.1.3.3
- “Temporary SU Tab,” Section 2.2.1.3.4
- “Channels Tab,” Section 2.2.1.4.3

2.2.2.1 Micro Base Station General Tab

<b>Identifiers</b> Name Location Contact	<div></div> <div></div> <div></div>	<b>Bridging</b> Bridge Aging Time 500	
<b>Software</b> Main File Main Version Shadow File Shadow Version Running Version Boot Version	micro_2_5_2_5.res 2.5.2.5 NONE NONE Main 1.0.2.21_SI	<b>Number of Registered SUs</b> 4	
<b>Control</b> Set Default Action	<div>None</div> <div>None</div>	<b>Temperature</b> Temperature(°C) 30	
<b>Voice Calls</b> Max. No. of Calls Active Voice Calls DRAP TTL Retries	22 0 4	<b>Cumulative Power On Time</b> Hours 2926	

Figure 2-22: Micro Base Station General Tab

The Micro Base Station *General* tab includes the following components:

Identifiers	
Name	The name of the Micro Base Station. A string of up to 255 characters.



<i>Location</i>	The location of the Micro Base Station. A string of up to 255 characters.
<i>Contact</i>	The contact name. A string of up to 250 characters

#### Software

<i>Main File</i>	The name of the main file. This name does not necessarily include clear identification of the SW version number. Every time the Micro Base Station resets, it will reboot using the file defined as Main.
<i>Main Version</i>	A read-only display of the main SW version.
<i>Shadow File</i>	The name of the shadow SW file. Typically, the Shadow file is the backup file. Every time a new SW File is downloaded to the Micro Base Station, it is stored as a Shadow file, replacing the previous Shadow file.
<i>Shadow Version</i>	A read-only display of the shadow SW version.
<i>Running Version</i>	A read-only display of the running SW version (Main or Shadow).
<i>Boot Version</i>	A read-only display of the SW boot version.

#### Control

<i>Set Default</i>	Enables to revert all Micro Base Station parameters to factory default  <b>WARNING</b> - Setting the parameters of the Micro Base Station to their default values will disable remote management of the Micro Base Station and may result in loss of connectivity.
<i>Action</i>	A drop-down menu enabling to select the SW versions control operation to be executed by the Micro Base Station. The possible actions are: None, Reset, Run from Shadow, Set as Main.

#### Voice Calls

<i>Max. No. of Calls</i>	The maximum number of simultaneous voice calls that can be supported by the Micro Base Station. The range is between 0 and 50.
<i>Active Voice Calls</i>	The number of currently active voice calls handled by the Micro Base Station.

*DRAP TTL Retries*

The limit of TTL retries for gateways that support the DRAP protocol before concluding that the gateway is no longer active and removing it from the database. The TTL retry time (the maximum time between two consecutive Allocation Requests) is 255 seconds.

The range is from 1 to 100.

The default is 4.

**Note** - During SW download to a gateway, which may take up to almost 15 minutes under worst conditions, the DRAP protocol is not active. If the gateway is removed from the database before SW download is completed, the download process will fail. During SW download, the DRAP TTL Retries parameter should be set to its default value of 4 (equivalent to 17 minutes).

**Bridging***Bridge Aging Time*

The aging time for all addresses in the Forwarding Data Base. The available values are from 1 to 1440 minutes or null for no aging.

**Number of Registered SUs**

A read-only display of the number of SUs registered to the selected Micro Base Station.

**Temperature***Temperature (°C)*

A read-only display of the Micro Base Station IDU's temperature.

**Cumulative Power on Time***Hours*

The cumulative power-on time of the Micro Base Station since first power-up.

2.2.2.2 Micro Base Station Hardware Tab

The Micro Base Station *Hardware* tab includes read-only details on the versions of the IDU.

IDU	
Serial #	6420363.75BCD15
Main Card Revision	2.2
Main Card Description	1.0
IF Card Revision	2
IF Card Description	0
Boot Version	1.0.4

Figure 2-23: Micro Base Station Hardware Tab

The Micro Base Station *Hardware* tab includes the following components:

IDU	
<i>Serial #</i>	A read-only display of the IDU's serial number.
<i>Main Card Revision</i>	A read-only display of the main card's revision.
<i>Main Card Description</i>	A read-only display of the main card's description.
<i>IF Card Revision</i>	A read-only display of the Micro Base Station's IF card revision.
<i>IF Card Description</i>	A read-only display of the Micro Base Station IF card description.
<i>Boot Version</i>	A read-only display of the IDU's boot version.

2.2.2.3 Micro Base Station Air Interface Tab

The Micro Base Station *Air Interface* tab enables to view and configure parameters that affect the wireless link. The parameters in green will take effect only after reset.

Base Station ID

	Operator			Cell		Sector
Current	186	190	0	0	0	0
Configured	186	190	0	0	0	0

Current ARQ Status Disabled

Configured ARQ Status Disabled

Max. Cell Radius (km) 20

Multi Rate Parameters

Multirate Support Enabled

UL Basic Rate BPSK 1/2

DL Basic Rate BPSK 1/2

Bandwidth (MHz)

Current 3.5

Configured 3.5

ATPC Parameters

Optimal UL RSSI (dBm) -73

ATPC Support Enabled


 The parameters in green will take effect only after reset.

Figure 2-24: Micro Base Station Air Interface Tab

The Micro Base Station *Air Interface* tab comprises the following components:

Base Station ID	
Operator ID, Cell ID and Sector ID (Current/Configured)	The Current/Configured values for the Base Station ID. The Base Station ID is the unique identifier of a Micro Base Station. An SU can be authenticated by a Micro Base Station only if the Base Station ID and Base Station ID Mask in the SU match the Base Station ID configured in the Micro Base Station. The Base Station ID comprises 6 groups of up to three digits each, where the range for each group is 0 to 255. The first 3 groups define the Operator ID, the next two groups define the Cell ID, and the sixth group defines the Sector ID (Micro Base Station).
ARQ Status (Current/Configured)	<div>The ARQ Enable/Disable parameter controls whether to use an ARQ algorithm for detecting errors and requesting retransmissions of applicable unicast messages (applicable only for Best Effort and Non Real Time services).</div> <div>The default is Disable.</div>

**Max. Cell Radius (km)**

The Maximum Cell Radius is used to adapt various timing parameters of the MAC to the time it takes a message to reach its destination. This time delay is dependent upon the distance between the originating and receiving units. The timing parameters should be adapted to the largest expected delay, which is determined from the distance from the Micro Base Station of the farthest SU served by it.

For Non-Line-Of-Sight (NLOS) links using refractions, the cell distance should be higher than the line-of-sight distance. Typically a 10% margin is a good estimate for the increase in distance due to the NLOS operation.

The basic time element (symbol) used by the system is 68 microseconds. This symbol size is translated to a round trip delay of approximately 20 km, or a cell radius of 10 km. Thus, it is recommended to set the Maximum Cell Radius using a resolution of 10 km: the actual timing of the system is the same for any cell radius larger than  $N \times 10$  km and smaller than or equal to  $(N+1) \times 10$ .

An SU located at a distance larger than the Maximum Cell Radius will be rejected during the network entry process.

The values range is from 10 to 110 km. Use 10 km increments (10, 20, ....110).

The default is 20 km.

**Multi Rate Parameters****Multirate Support**

The Multirate Support parameter controls whether or not the multirate algorithm will be used to determine current optimal rates in both the uplinks and downlinks. Typically, the multirate algorithm should always be enabled. The Disable option enables using a fixed rate, and is intended to support special tests. After each reset, the Micro Base Station boots with Multirate Support enabled, disregarding its status before the device was reset.

**UL/DL Basic Rate**

These parameters define the Basic Rate for the uplink and downlink (see [Table 2-1](#)).

**Bandwidth (MHz)****Current/Configured**

The frequency bandwidth used by the radio. A change in the Bandwidth parameter will take effect only after resetting the Micro Base Station.

The Admin Status of all Channels belonging to the Micro Base Station must be disabled to enable a configuration change in the Bandwidth parameter.

The available options are: 1.75 MHz and 3.5 MHz.

The default is 3.5 MHz.

#### ATPC Parameters

<i>Optimal UL RSSI (dBm)</i>	<p>The Optimal Uplink RSSI sets the target level at which all transmissions should be received by the AU-ODUs for optimal performance.</p> <p>The range is -103 to -60 (dBm).</p> <p>The default is -69 dBm.</p>
<i>ATPC Support</i>	<p>The Automatic Transmit Power Control (ATPC) Support parameter controls whether or not the ATPC algorithm will be used to determine optimal transmit level for each of the SUs served by the Micro Base Station.</p> <p>The default is Enable.</p> <p>The ATPC algorithm should always be enabled. The option to disable it is available to enable using a fixed rate to support certain tests. After each reset, the Micro Base Station boots with the ATPC enabled, disregarding its status before the device was reset.</p>

2.2.2.4 Micro Base Station Interfaces Tab

The Micro Base Station *Interfaces* tab enables to view and configure parameters that affect the operation of the Data and Management ports.

**Data Port**  
IP Address11.11.11.10  
Subnet Mask255.255.255.0  
Default Gateway11.11.11.250  
VLAN ID4095 ☒ None  
Current AutoNegotiationEnable  
Current Speed & DuplexFull Duplex 100Mbps  
Config. Auto NegotiationEnabled  
Config. Speed & DuplexFull Duplex 100Mt

**Management Port**  
IP Address172.30.101.176  
Subnet Mask255.255.255.0  
Default Gateway172.30.101.254  
Network Destination128.0.0.0  
Network Dest. Mask128.0.0.0  
Current Auto NegotiationEnable  
Current Speed & DuplexFull Duplex 100Mbps  
Config. Auto NegotiationEnabled  
Config. Speed & DuplexFull Duplex 100Mt


 **The parameters in green will take effect only after reset.**

Figure 2-25: Micro Base Station Interfaces Tab

The Micro Base Station *Interfaces* Tab comprises the following components (fields in green are accepted only after reset):

Data Port	
IP Address	The IP address of the Data Port.
Subnet Mask	The IP subnet mask for the Data port.
Default Gateway	The default Gateway IP address for the Data port.
VLAN ID	The VLAN ID for management frames. If a value between 0 and 4094 is configured for the Management VLAN ID, the device will accept management frames only if their VLAN tag has the identical value. A value of 4095 means No VLAN. Enter 4095 or select the <b>None</b> check box to accept all management frames regardless of their VLAN tag (No VLAN).
Auto Negotiation (Current/Configured)	The current/configured Auto Negotiation status for the Ethernet interface of the data port in the Micro Base Station.
Speed & Duplex (Current/Configured)	The current/configured speed and duplex status for the Ethernet interface of the data port in the Micro Base Station. The Configured Speed & Duplex is applicable only if the Configured Auto Negotiation is Disabled.

**Management Port**

<i>IP Address</i>	The IP address of the Management Port.  <b>CAUTION:</b> Do not configure the IP Address of the Management port to 0.0.0.0, as this will cause loss of management connectivity via the DATA port.
<i>Subnet Mask</i>	The IP subnet mask for the Management port.
<i>Default Gateway</i>	The default Gateway IP address for the Management port.
<i>Network Destination &amp; Network Dest. Mask</i>	These two parameters define the IP subnet of stations that can manage the device when connected through a router to the Management port. All management frames destined for addresses belonging to this group will be routed via the Management port. All management frames destined for other addresses will be routed via the Data port.
<i>Auto Negotiation (Current/Configured)</i>	The current/configured Auto Negotiation status for the Ethernet interface of the management port in the Micro Base Station.
<i>Speed &amp; Duplex (Current/Configured)</i>	The current/configured speed and duplex status for the Ethernet interface of the management port in the Micro Base Station. The Configured Speed & Duplex is applicable only if the Configured Auto Negotiation is Disabled.

**NOTE**

- The Micro Base Station can be managed either In Band (IB) via the Data port or Out Of Band (OOB) via the Management port. It is highly recommended to use the Management port for local management only. Typically the port should be down (disconnected).
- The IP Addresses of the Data and Management ports must belong to different subnets.
- If a Default Gateway is specified for the Management port (an address other than the 0.0.0.0 default, which means "no default gateway"), network destination parameters must be defined as well. The network destination subnet must be different from both the Data port and the Management port subnets.

**CAUTION**

Changing the parameters may result in loss of connectivity and may disable remote management of the Micro Base Station.

### 2.2.2.5 Micro Base Station Ports Counters Tab

The Micro Base Station *Ports Counters* tab enables to view and reset the Micro Base Station Ethernet Ports and Wireless Port counters.



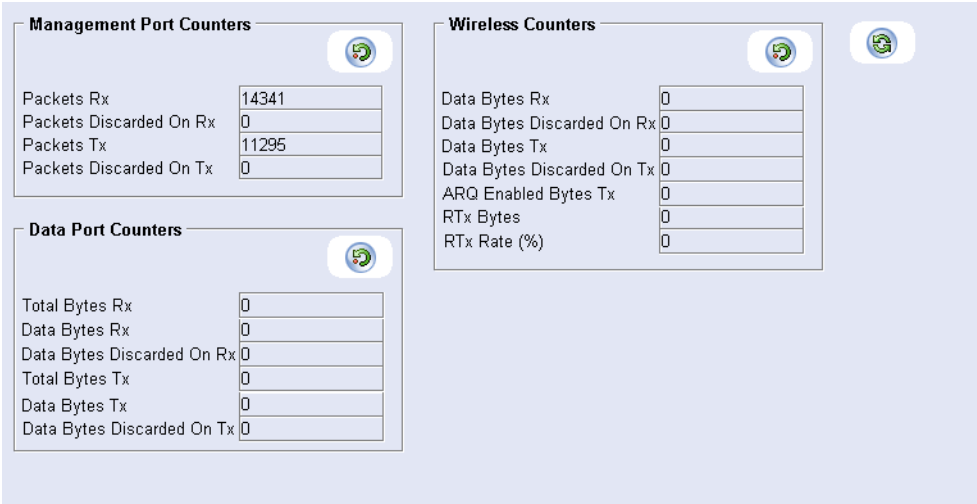


Figure 2-26: Micro Base Station Ports Counters Tab

The information displayed for each counter is the accumulated number since the last time the counters were reset. The counters are reset each time the Micro Base Station is reset, or upon activating the Reset Counters option.

The displayed counters include:

Management Port Counters	
<i>Packets Rx</i>	The total number of packets received on the interface. Packets with errors are not counted.
<i>Packets Discard On Rx</i>	Packets received from the Management port that were discarded.
<i>Packets Tx</i>	The total number of packets transmitted to the interface. Packets with errors are not counted.
<i>Packets Discard On Tx</i>	Always 0. Currently packets are not discarded on Tx.
Data Port Counters	
<i>Total Bytes Rx</i>	The total number of bytes received from the Data port, including Management frames. Frames with errors are not included.
<i>Data Bytes Rx</i>	The total number of data bytes received from the Data port. Management frames and frames with errors are not included.
<i>Data Bytes Discarded on Rx</i>	The number of bytes in packets discarded due to internal communication errors.
<i>Total Bytes Tx</i>	The total number of bytes transmitted to the Data port, including Management frames. Frames with errors are not included.
<i>Data Bytes Tx</i>	The total number of data bytes transmitted to the Data port. Management frames and frames with errors are not included.

*Data Bytes Discarded on Tx*      This count is always 0 (No discards).

#### Wireless Port Counters

*Data Bytes Rx*      The total number of data bytes received from the Wireless link. MAC management frames and frames with errors are not included.

*Data Bytes Discarded on Rx*      The number of bytes in packets received from the Wireless link and discarded due to MAC protocol receive errors, such as duplicate sequence number, wrong sequence number etc. (not CRC errors).

*Data Bytes Tx*      The total number of data bytes transmitted to the Wireless link. MAC Management frames and frames with errors are not included.

*Data Bytes Discarded on Tx*      The number of bytes in packets discarded due to congestion in the wireless medium.

*ARQ Enabled Bytes Tx*      The number of bytes transmitted over BE and NRT connections. Applicable only if the ARQ mechanism is enabled.

*RTx Bytes*      The number of unacknowledged bytes that were retransmitted. Retransmissions are applicable only to BE and NRT connections provided the ARQ mechanism is enabled.

*RTx Rate (%)*      Retransmission Rate in percents is defined as:  
$$100 * (\text{Bytes Retransmitted}) / (\text{ARQ Enabled Bytes Transmitted}).$$

The Micro Base Station *Ports Counters* tab also includes the following button:



Refresh counters

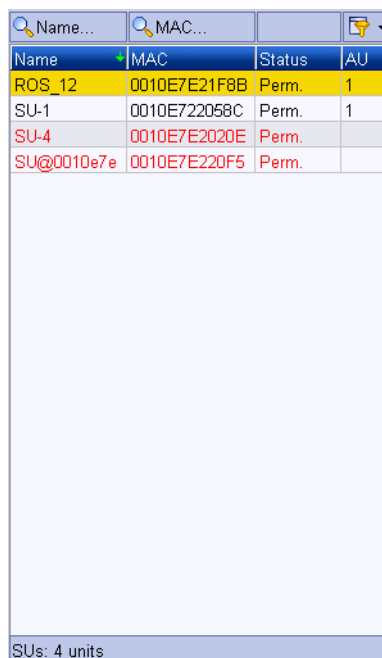


Reset counters (per counters)

## 2.3 SU Configuration

This section describes the configuration of Subscriber Units associated with the Base Station (whether Modular Base Station or Micro Base Station). Unless otherwise specified, the various tabs are identical for both Modular Base Station and Micro Base Station.

The *SU Configuration* window displays status information on the Subscriber Units associated with the selected Base Station. Units displayed in red are disconnected.



Name	MAC	Status	AU
ROS_12	0010E7E21F8B	Perm.	1
SU-1	0010E722058C	Perm.	1
SU-4	0010E7E2020E	Perm.	
SU@0010e7e	0010E7E220F5	Perm.	

SUs: 4 units

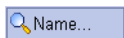
**Figure 2-27: Subscriber Units List**

The list of SUs displays the following information on each Subscriber Unit:

<i>Name</i>	The name of the SU.
<i>MAC</i>	The MAC address of the SU.
<i>Status</i>	The status of the SU, whether <b>temporary</b> or <b>permanent</b> .
<i>AU</i>	The AU to which the SU is connected (NA to Micro Base Station)

The List of SUs can be sorted by clicking on any of the column headers (Name, MAC, Status, AU). The list is sorted in ascending order according to the selected column. Click the column header again to sort in descending order.


You can search for a specific SU by clicking on one of the search buttons:



Search for an SU by name.



Search for an SU by MAC address.

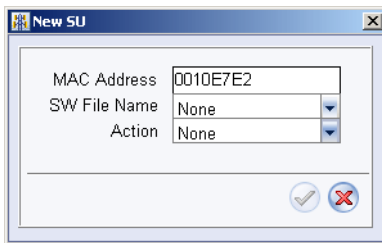
You can apply a filter to the list of SUs by clicking on the Filter button (  ). Only the SUs that match the selected filter will be displayed, as follows:

<i>Show All</i>	All SUs will be displayed.
<i>Connected</i>	Only connected SUs will be displayed.
<i>Disconnected</i>	Only disconnected SUs will be displayed.
<i>Permanent</i>	Only permanent SUs will be displayed.
<i>Temporary</i>	Only temporary SUs will be displayed.



**To add an SU:**

Click on the Add button in the toolbar. The New SU dialog box opens:



**Figure 2-28: New SU Dialog Box**

Enter the parameters of the new SU:

<i>MAC Address</i>	The MAC address of the SU.
<i>SW File Name</i>	Optional: From the drop-down menu that includes all SU SW Files in the NPU/Micro Base Station, select the SW File to be loaded to the SU upon first registration.
<i>Action</i>	The action to be taken with the selected SW File upon first registration: None, Load to Shadow, Run from Shadow, Set as Main.

The new SU is added as a Permanent SU.

## 2.3.1 SU General Tab

**Figure 2-29: SU General Tab**

The *SU General* Tab includes the following components:

### Identifiers

<i>Name</i>	<p>The SU's name. A string of up to 32 printable characters.</p> <p>The default SU Name given to a new SU during the definition process is SU@&lt;SU's MAC Address&gt;. When an SU is registered, it receives services based on its MAC address, and the default SU Name is replaced by the name configured in the SU (Common Name).</p> <p>Under normal conditions, the SU Name should be changed only upon identifying an SU with an SU Name that is identical to that of a previously registered SU. In this case, the new SU will be registered (to enable management), but will not receive any services. Its name in the database of the serving device will be changed to SU@&lt;SU's MAC Address&gt;. The system administrator will be informed of the problem through the Service Fault Status parameter (see below) and through a trap message (rbSuDuplicateName trap). If the administrator decides that the SU is legitimate and should receive services, a new SU Name must be configured. The SU will receive services only after configuring it with a unique SU Name.</p> <p>A new SU Name can be configured also for a temporary SU.</p>
<i>MAC Address</i>	<p>A read-only display of the MAC address of the SU.</p>

<i>Installer Password</i>	The installer password. The Installer Password is used for accessing the SU's Monitor (Installer) program or web server locally, using the SU's Ethernet port. The Installer Password consists of a string of up to 20 printable characters, case sensitive.
<i>SU Type</i>	A read-only display of the SU type: CPE, PRO CPE, CPE-PRO-L or CPE-SI.
<i>Associated AU</i>	The slot number of the associated AU. Not applicable for a Micro Base Station.
<i>Organization</i>	A read-only display of the Organization name, as configured in the SU.
<i>Address</i>	A read-only display of the SU's Address, as configured in the SU.
<i>Country</i>	A read-only display of the Country name, as configured in the SU.

#### Status

<i>Registration Status</i>	A read-only display of the SU's registration status.
<i>Fault Status</i>	A read-only display of the SU's fault status.
<i>Permanence Status</i>	The permanence status of the SU. Available permanence statuses are: <b>Permanent</b> and <b>Temporary</b> .
<i>Service Fault Status</i>	OK or reason for denying services to the SU. The reason can be: <ul style="list-style-type: none"><li>■ Loop problem. A loop was detected on the Ethernet side of the SU. rbNetworkingError Trap will be sent, and services to this SU will be denied until resetting the SU from the network (NPU/Micro Base Station) side (provided the problem no longer exists). The problem is detectable through periodical (every 5 seconds) transmissions to the Ethernet link of SNAP packets with "AA AA 03" in the header, and the destination MAC address is 00:10:E7:00:00:01. If the SU receives this packet from the Ethernet, it means that there is a loop and the SU will send an appropriate message to the NPU/Micro Base Station.</li><li>■ Duplicate SU Name: The SU Name is already in use by another SU. rbSuDuplicateName Trap will be sent and services to the SU will be denied until another unique name is configured for the SU.</li></ul>

#### Software

<i>Main File</i>	The name of the downloaded SW file. This name does not necessarily include clear identification of the SW version number.
<i>Main Version</i>	A read-only display of the main SW version. Every time the SU resets, it will reboot using the version defined as Main.
<i>Shadow File</i>	The name of the shadow SW file. Typically, the Shadow file is the backup file. Every time a new SW File is downloaded to the SU, it is stored as a Shadow file, replacing the previous Shadow file.
<i>Shadow Version</i>	A read-only display of the shadow SW version.

*Running Version* A read-only display of the running SW version.

#### Control

*Set Default* Enables to revert all parameters to factory default.

*Action* A drop-down menu enabling to select the operation to be executed on the SU. The possible actions are:

Temporary SUs: None, Reset

Permanent SUs: None, Reset, Run from Shadow, Set as Main.

#### Cumulative Power On Time

*Hours* The cumulative power-on time of the SU since first power-up.

#### License (L model only)

*ID* The relevant license type. In the current version only a Bandwidth license type is available.

*Value* The specific details of the relevant licenses. In the current version all Bandwidth licenses are Unlimited.

#### CAUTION



Reverting the parameters to factory default will result in loss of connectivity.

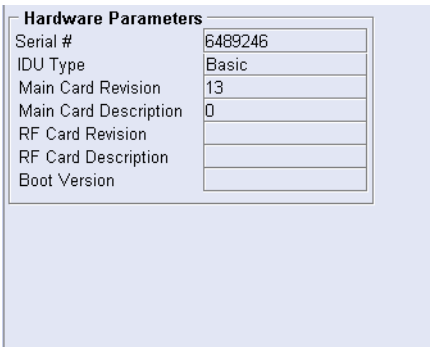


#### To add a License to an L model SU (CPE-PRO-L):

In the current release only an Unlimited Bandwidth license can be added to an L model CPE. The Add button above the License table is available only when the table is empty. To add an Unlimited Bandwidth license to the SU (provided a license is available in the SUs License Bank), click on the Add button and confirm the request.

## 2.3.2 SU Hardware Tab

The SU *Hardware* tab includes read-only information on the versions of the IDU and ODU.



Hardware Parameters	
Serial #	6489246
IDU Type	Basic
Main Card Revision	13
Main Card Description	0
RF Card Revision	
RF Card Description	
Boot Version	

**Figure 2-30: SU Hardware Tab**

The SU *Hardware* tab includes the following components:

<i>Serial #</i>	A read-only display of the ODU's serial number.
<i>IDU Type</i>	A read-only display of the IDU type (not applicable for CPE-SI): <b>Basic</b> or <b>IDU-NG-4D1W Wireless Networking Gateway</b>
<i>Main Card Revision</i>	A read-only display of the main card revision.
<i>Main Card Description</i>	A read-only display of the main card description.
<i>RF Card Revision</i>	A read-only display of the RF card revision.
<i>RF Card Description</i>	A read-only display of the RF card description.
<i>Boot Version</i>	A read-only display of the boot version.



## 2.3.3 SU Air Interface Tab

The *SU Air Interface* tab enables to view and configure parameters that affect the wireless link.

Base Station ID													
Operator						Cell							
Sector						Operator							
Cell						Sector							
ID	186	190	0	0	250	206	Configured	186	190	0	0	250	206
Mask	255	255	255	0	0	0	Configured	255	255	255	0	0	0

Phy Parameters	
Bandwidth (MHz)	3.5 Configured 3.5
Uplink Tx Frequency (MHz)	3410 Configured 3410

Multirate	
Multirate Support	Enabled
Uplink Current Rate	QAM64 3/4
Downlink Current Rate	QAM64 3/4


  

ATPC Parameters	
ATPC Support	Enabled
Tx Power (dBm)	9.84
Uplink SNR (dB)	28.10
Uplink RSSI (dBm)	-74.10
Downlink SNR (dB)	34
Downlink RSSI (dBm)	-56

Distance from the Base Station	
Meters	0

 **The parameters in green will take effect only after reset.**

**Figure 2-31: SU Air Interface Tab**

The *SU Air Interface* tab includes the following components:

### Base Station ID

#### *ID and Mask*

The Current/Configured values for the Base Station ID and Mask. The Base Station ID is the unique identifier of an AU/Micro Base Station. An SU can be authenticated by an AU/Micro Base Station only if the Base Station ID and Base Station ID Mask in the SU match the Base Station ID configured in the AU/Micro Base Station.

### Phy Parameters

#### *Bandwidth (MHz)*

The Configured and Current Bandwidth (MHz) parameters enable to configure the bandwidth to be used after the next reset and to view the current operational bandwidth.

The available options are: 1.75 MHz and 3.5 MHz.

<i>Uplink Tx Frequency (MHz)</i>	The Configured and Current Uplink (Tx) Frequency (MHz) parameters enable to configure the uplink (SU to AU/Micro Base Station) frequency to be used after the next reset and to view the current operational frequency.
----------------------------------	---

#### Multirate

<i>Multirate Support</i>	Displays the current status of the multirate parameters.
<i>Uplink/Downlink Current Rate</i>	<p>This option is available only when the Multirate algorithm is disabled in the AU/Micro Base Station, allowing to set the Uplink Current Rate and the Downlink Current Rate to any of the available values (See <a href="#">Table 2-1</a>).</p> <p>The defaults are the last rates used by the Multirate algorithm before it was disabled. For SUs that join the cell when the Multirate algorithm is disabled, the defaults are the applicable Basic Rates.</p>

#### ATPC Parameters

<i>ATPC Support</i>	A read-only display of the status of the ATPC Support parameter. This parameter is controlled by the AU/Micro Base Station, and typically, it is configured to Enabled. (It may be temporarily changed locally in the SU using the Installer Monitor program or the web server)
<i>Tx Power (dBm)</i>	A read-only display of the current transmit power level at the antenna port of the SU.
<i>Uplink SNR (dB)</i>	A read-only display of the Signal to Noise Ratio (SNR) at which the AU/Micro Base Station receives the SU.
<i>Uplink RSSI (dBm)</i>	A read-only display of the level (Received Signal Strength Indicator) at which the AU/Micro Base Station receives the SU.
<i>Downlink SNR (dB)</i>	A read-only display of the Signal to Noise Ratio (SNR) at which the SU receives the AU/Micro Base Station.
<i>Downlink RSSI (dBm)</i>	A read-only display of the level (Received Signal Strength Indicator) at which the SU receives the AU/Micro Base Station.

#### Distance from the Base Station

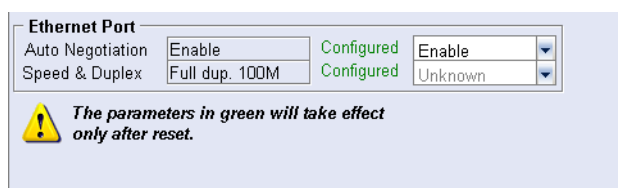
<i>Meters</i>	A read-only display of the estimated distance (in meters) of the selected SU from the Base Station. The accuracy is from several hundreds of meters for line-of-sight links to 1500 meters for non-line-of-sight links.
---------------	---

**Table 2-1: Rates (Modulation Schemes and Coding)**

No.	Rate
1	BPSK 1/2
2	BPSK 3/4
3	QPSK 1/2
4	QPSK 3/4
5	QAM16 1/2
6	QAM16 3/4
7	QAM64 2/3
8	QAM64 3/4

### 2.3.4 SU Interface Tab

The *SU Interface* tab enables to view and configure parameters that affect the operation of the Ethernet port.

**Figure 2-32: SU Interface Tab**

The *SU Interface* tab includes the following components:

*Auto Negotiation*  
(Current/Configured)

The Configured and Current status of the Auto Negotiation mode (Enabled or Disabled) used by the SU.

*Speed & Duplex*  
(Current/Configured)

A drop-down menu that enables to select the Ethernet link speed (Full Duplex 100 Mbps, Half Duplex 100 Mbps, Full duplex 10 Mbps, Half Duplex 10 Mbps). Applicable only if Auto Negotiation is Disabled.

### 2.3.5 SU Bridging Tab

The *SU Bridging* tab enables setting a limit on the maximum number of Ethernet devices behind the SU and configuring the aging time for devices in the SU's bridging table.

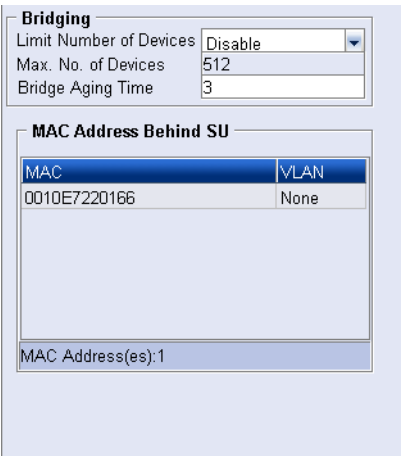


Figure 2-33: SU Bridging Tab

The SU *Bridging* tab includes the following components:

Bridging	
<i>Limit Number of Devices</i>	Enable/Disable limit on number of supported devices.  When disabled, the maximum number of supported devices is 512.
<i>Max. No. of Devices</i>	This parameter is applicable only when the Enable/Disable Limit on Number of Devices parameter is set to Enable.  The available range is from 1 to 512 devices.  The default is 512.
<i>Bridge Aging Time</i>	The Bridge Aging Time sets the aging time for all addresses in the SU's Forwarding Data Base.  The available values are from 1 to 1440 minutes.  The default is 3 minutes.
MAC Address Behind SU table	
<i>MAC Address</i>	MAC address of an Ethernet device behind the SU.
<i>VLAN ID</i>	The VLAN ID used by the device (if any).

## 2.3.6 SU Gateways Tab

The *Gateways* tab is available for SUs with a Networking Gateway IDU and/or SUs with Voice Gateways. Note that the table may include more than one entry. The *Gateways* tab displays read-only information on the Gateway, and provides http cut-through to the Voice Gateway or Networking Gateway.

Device IP	Device Type	Device VLAN
<a href="#">11.11.11.21</a>	1D2V	4095

**Figure 2-34: Gateways Tab**

The *Gateways* tab includes the following components:

<i>Device IP</i>	The IP address of the Gateway.
<i>Device Type</i>	The type of Gateway
<i>Device VLAN</i>	The VLAN used for the Gateway. 4095 denotes no VLAN. The Device VLAN is the Management VLAN ID, and is applicable only for Voice Gateways.

## 2.3.7 SU Ports Counters Tab

The *SU Ports Counters* tab enables viewing or resetting the Ethernet and Wireless ports counters. The information displayed for each counter is the accumulated number since the last time the counters were reset. The counters are reset each time the SU is reset, or upon activating the Reset Counters option.

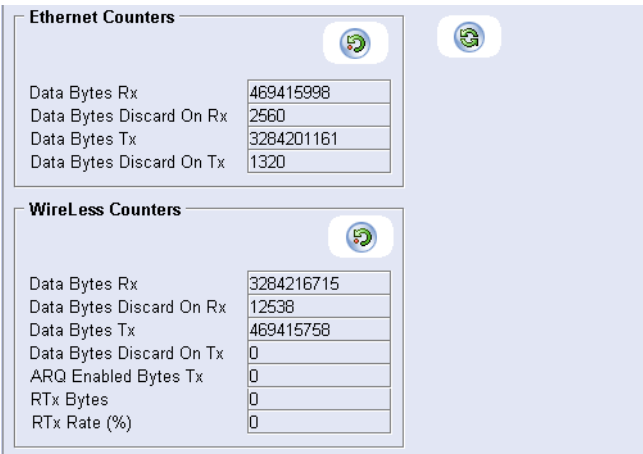


Figure 2-35: SU Ports Counters Tab

The displayed counters include:

Ethernet Counters	
<i>Data Bytes Rx</i>	The total number of data bytes received from the Ethernet link. Management frames and frames with errors are not included.
<i>Data Bytes Discard on Rx</i>	The number of bytes discarded when a packet received from the Ethernet port is not forwarded to the Wireless port due to bridging or classification considerations.
<i>Data Bytes Tx</i>	The total number of data bytes transmitted to the Ethernet link. Management frames and frames with errors are not included.
<i>Data Bytes Discard on Tx</i>	The number of bytes discarded when a packet received from the Wireless port is not forwarded to the Ethernet port due to bridging or VLAN considerations.

Wireless Counters	
<i>Data Bytes Rx</i>	The total number of data bytes received from the Wireless link. Management frames and frames with errors are not included.
<i>Data Bytes Discard on Rx</i>	The number of bytes in packets received from the Wireless link and discarded due to MAC protocol receive errors, such as duplicate sequence number, wrong sequence number etc. (not CRC errors).
<i>Data Bytes Tx</i>	The total number of data bytes transmitted to the Wireless link. MAC Management frames and frames with errors are not included.
<i>Data Bytes Discard on Tx</i>	The number of bytes in packets discarded due to congestion in the wireless medium.
<i>ARQ Enabled Bytes Tx</i>	The number of bytes transmitted over BE and NRT connections. Applicable only if the ARQ mechanism in the AU is enabled.

<i>RTx Bytes</i>	The number of unacknowledged bytes that were retransmitted. Retransmissions are applicable only to BE and NRT connections, provided the ARQ mechanism in the AU is enabled.
<i>RTx Rate (%)</i>	Retransmission Rate in percents is defined as: $100 * (\text{Bytes Retransmitted}) / (\text{ARQ Enabled Bytes Transmitted})$ .

The SU *Ports Counters* tab also includes the following buttons:



Refresh counters



Reset counters

## 2.3.8 SU Burst Counters Tab

The Burst Error rate Counters option enables viewing or resetting the Burst Error Rate counters. The information displayed for each rate in uplink and downlink is the accumulated number since the last time the counters were reset.

The SU *Burst Counters* tab enables viewing or resetting the Burst Error Rate counters for both downlink and uplink. The information displayed for each rate is the accumulated number since the last time the counters were reset. The counters are reset each time the SU is reset, or upon activating the Reset option.

Down Link					
Rate	Error Burst	Total Burst	Burst Error Rate		
BPSK 1/2	6562	22254318	2.9E-4		
BPSK 3/4	2	17463085	1.1E-7		
QPSK 1/2	1	17463090	5.7E-8		
QPSK 3/4	3	17463092	1.7E-7		
QAM16 1/2	3	17463090	1.7E-7		
QAM16 3/4	1	17463088	5.7E-8		
QAM64 2/3	1	17463090	5.7E-8		
QAM64 3/4	0	19135957	0.0E-0		
Up Link					
Rate	Error Burst	Total Burst	Burst Error Rate		
BPSK 1/2	0	0	0.0E-0		
BPSK 3/4	0	0	0.0E-0		
QPSK 1/2	0	0	0.0E-0		
QPSK 3/4	0	0	0.0E-0		
QAM16 1/2	0	12904	0.0E-0		
QAM16 3/4	0	12966	0.0E-0		
QAM64 2/3	0	10990	0.0E-0		
QAM64 3/4	0	102969978	0.0E-0		

Figure 2-36: SU Burst Counters Tab

The displayed counters include for each rate in the Downlink and Uplink:

Downlink/Uplink	
<i>Error Burst</i>	The number of bursts with errors.
<i>Total Burst</i>	The number of bursts transmitted.
<i>Burst Error Rate</i>	The calculated Burst Error Rate.

The SU *Burst Counters* tab also includes the following buttons:



Refresh counters



Reset counters





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## Chapter 3 - Software Upgrade



### In This Chapter:

- “Before You Start” on page 76
- “File Loading Procedure” on page 79
- “Working with Log Files” on page 81

## 3.1 Before You Start

Loading of new SW files to the unit's FLASH memory can be performed by a simple loading procedure.

Before performing an upgrade procedure, make sure you have the most recent instructions, and that the correct SW files are available in your computer.



### To access the SW Upgrade window:

- 1 In the BreezeLITE main window, select a Base Station from the list of Base Stations.
- 2 Click on the **SW Upgrade** icon on the *Application Bar*. The *SW Upgrade* window is displayed for the selected Base Station.

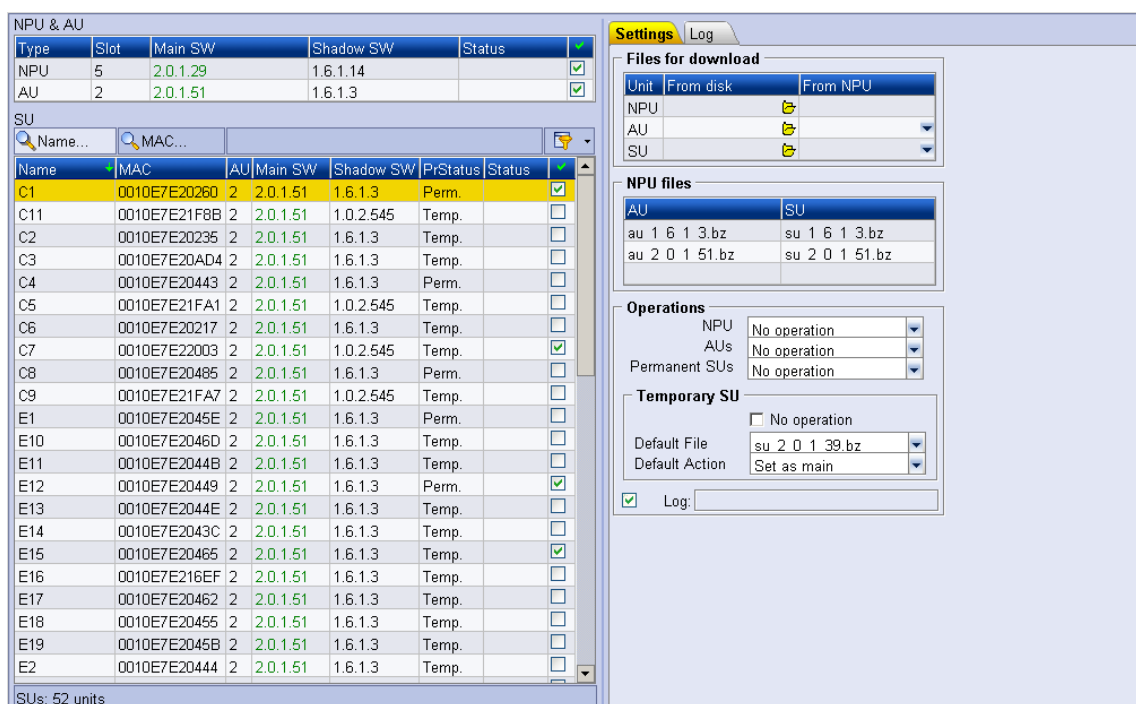
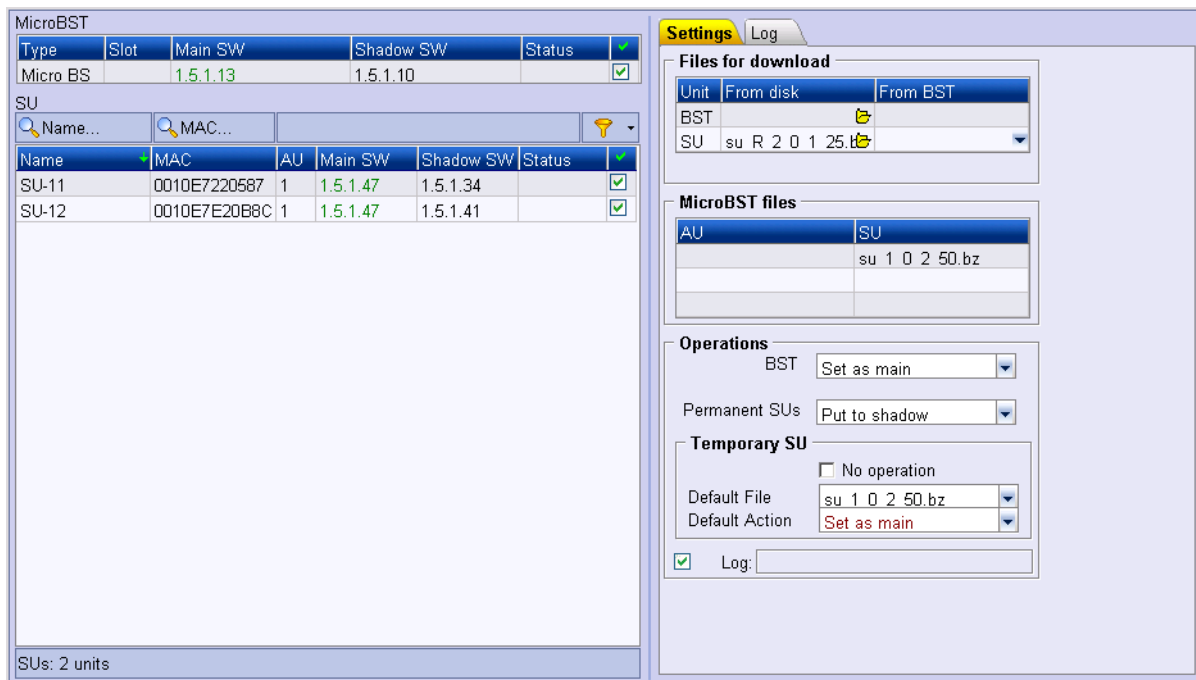


Figure 3-1: SW Upgrade Window - Modular Base Station



**Figure 3-2: SW Upgrade Window - Micro Base Station**

In addition to the components detailed in [Section 1.2](#), the work area of the SW Upgrade window includes the following components:

- **Components List:** Displays the components of the selected Base Station.
- **Tab Selection:** The Tab Selection area comprises two tabs (Settings and Log).
- **Selected Tab Area:** The Selected Tab Area is a workspace that varies according to the selected tab.

If you are loading new SU/AU SW files to the NPU/Micro Base Station, verify that no more than two SU/AU SW files exist in the NPU/Micro Base Station. The SU/AU SW files on the NPU/Micro Base Station are listed in the Settings tab in the *NPU/MicroBST files* area. If there are three SU/AU SW files in the unit, one of them must be deleted before loading a new SU/AU SW file.



**To delete an SU/AU SW file from NPU/Micro Base Station:**

- 1 Select a file in the *NPU/MicroBST files* area and click **Remove** on the toolbar. A confirmation message is displayed: Remove file '<file name>'?
- 2 Click **Yes**. The file is removed from the list.

## 3.2 File Loading Procedure

The upgrade procedure is performed for each Base Station/Micro Base Station separately. Upgrading of SU/AU is performed via the NPU/Micro Base Station. The SU/AU upgrade files must first be downloaded to the NPU/Micro Base Station and then to the SUs/AUs. Finally, depending on the parameter settings, the selected components' software version can be switched with the new version.

In BreezeLITE, the entire procedure can be performed simultaneously from the Settings tab:



### To upgrade NPU/AU/Micro Base Station/SU:

- 1 In the component list area, click inside the check-box to select the components for upgrade.
- 2 For NPU/Micro Base Station - click in the NPU/BST cell in the *From disk* column in the *Files for download* area. Browse to the folder on your local disk and select the NPU/Micro Base Station file for download.
- 3 For AU/SU - If the upgrade file is on your local disk, click in the AU or SU cell in the *From disk* column in the *Files for download* area. Browse to the folder on your local disk and select the AU/SU file for download. You can repeat this step for all AU/SU files for download.

OR

If the upgrade file is already in the NPU/Micro Base Station, select it from the drop-down menu in the *From NPU/BST* column in the *Files for download* area.

- 4 In the *Operations* area, select the operation to be performed with the software file for NPU/Micro Base Station, AUs and permanent SUs: No Operation, Reset, Load SU Files (NPU/Micro Base Station only), Load to NPU (AU only) Run from Shadow, and Set as Main.
- 5 In the *Temporary SU* area, select the operation to be performed with the software file for temporary SUs (see [Section 2.2.1.3.4](#) for details):
  - ◇ Select the default file
  - ◇ Select the default action: None, Load to Shadow, Run from Shadow, Set as Main



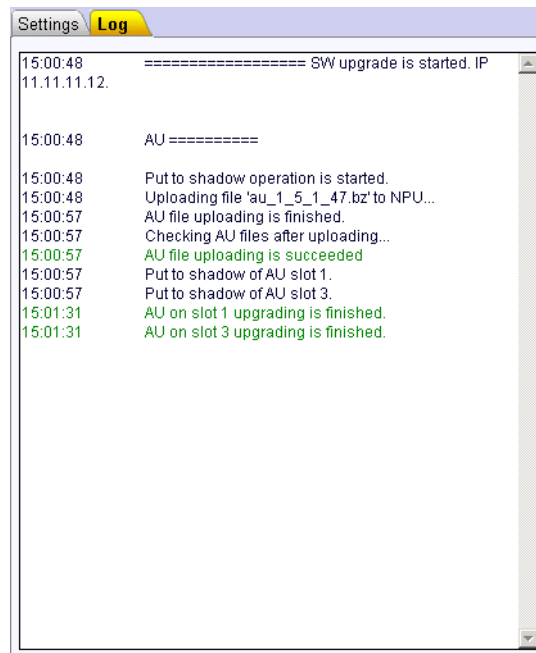
**NOTE**

Changes to the default file or default action parameters will also be reflected in the NPU/Micro Base Station temporary SUs tab ([Section 2.2.1.3.4](#)).

- 6 Click **Start** on the toolbar to start the upgrade. During the SW upgrade, the status column displays the status of the upgrade for each selected component.

### 3.3 Working with Log Files

BreezeLITE logs all upgrade operations in the *Log* tab:



**Figure 3-3: SW Upgrade Log Tab**

You can also export the log file to an external file (.swu), as follows:



#### **To export a Log file:**

In the *Settings* tab, click the Log check box before starting the upgrade. A Windows Save As window opens and a default name for the .swu file is provided with the following format: <Base Station IP address> <Date YYMMDD>\_<Time HHMM>. You can change the filename.

The .swu is stored in a default location (in the designated LOGs > SWu folder) and the file can be opened in MS Excel.



**To view an exported Log file:**

Open the log file in MS Excel. You can also view the data using any standard text editor. The table with the recorded data is displayed.





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## Chapter 4 - Monitoring



### In This Chapter:

- “Accessing the Monitor Application” on page 84
- “Using the Monitor Application” on page 87
- “Working with Log Files” on page 88

## 4.1 Accessing the Monitor Application

The *Monitor* application provides a selection of performance monitoring capabilities, enabling performance verification and problem identification. From the *Monitor* window you can monitor the performance of selected components.



### To access the Monitor Application:

- 1 In the BreezeLITE main window, select a Base Station from the list of Base Stations.
- 2 Click on the **Monitor** icon on the Application Bar. The *Monitor* window is displayed for the selected Base Station.

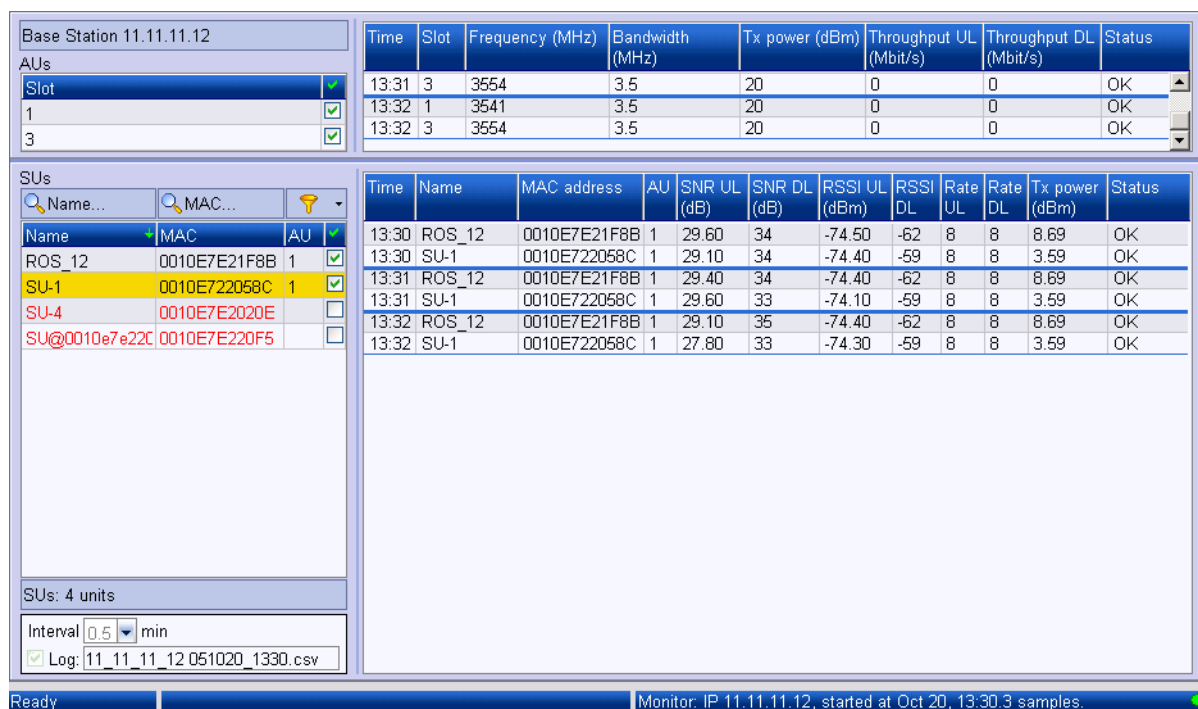
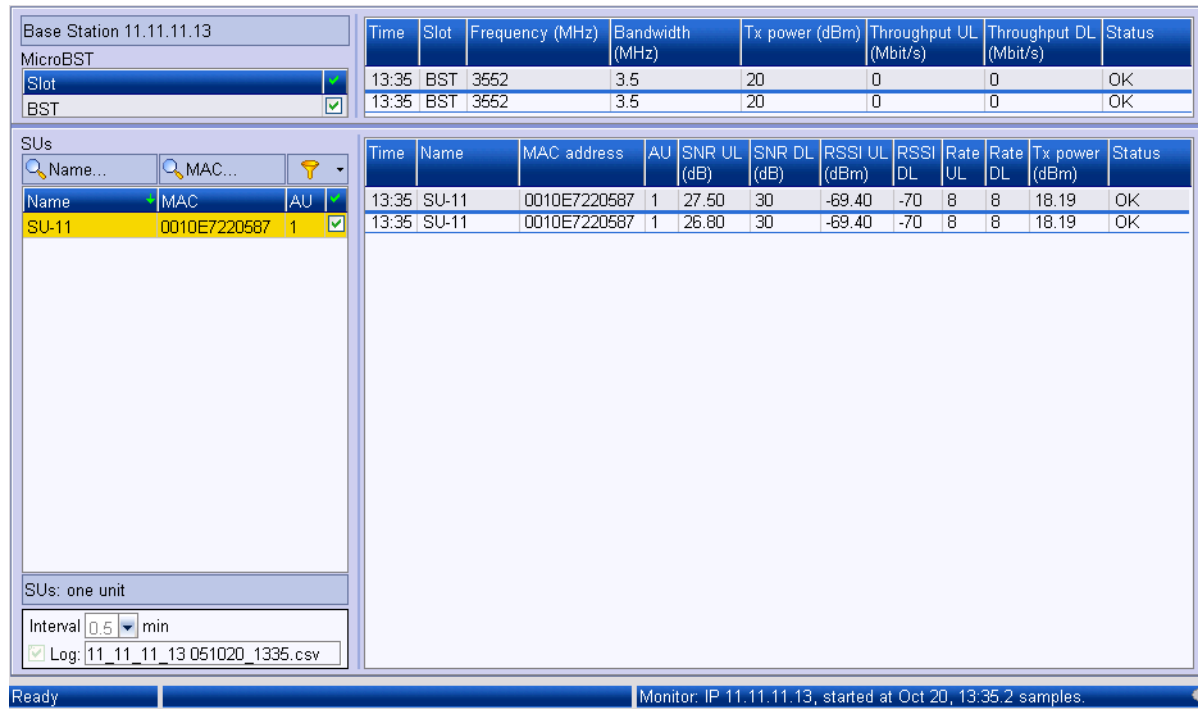


Figure 4-1: Monitor Window - Modular Base Station



**Figure 4-2: Monitor Window - Micro Base Station**

The *Monitor* window comprises the following components:

- **Base Station** - A read-only display of the IP address of the Base Station being monitored. When monitoring begins, you can resume the configuration of the Base Station/Micro Base Station, or switch to another Base Station/Micro Base Station.
- **AUs/MicroBST** - The list of AUs installed in the selected Modular Base Station, or the Micro Base Station. Click the check-box to select the component for monitoring. The received data is displayed in the table to the right.
- **SUs** - The list of all SUs associated with any of the AUs or with the Micro Base Station. Check the check-box to select the units for monitoring. The received data is displayed in the table to the right.
- **Interval** - Defines the time in minutes between two successive sample collection. The intervals are selectable from list ranging from 0.5 to 30 minutes.
- **Log** - Enables to save the collected data in an external file. See [Section 4.3](#) for details.

- Status bar - Displays details of the monitoring session (the IP of the Base Station being monitored, the time the monitoring session began and the number of samples gathered).

## 4.2 Using the Monitor Application



### To begin a monitoring session:

- 1 Select the components for monitoring by clicking the check box for each component.
- 2 Enter the time interval (in minutes) between samples.
- 3 Check the Log check box to export the log file to a .csv file.
- 4 Click on **Start** on the toolbar to begin the monitoring session. The results are displayed in the tables according to the selected components and according to the selected intervals. A bold line separates between the sample intervals. The number of rows between sample intervals depends on the number of components selected for monitoring.



#### NOTE

The tables display up to 1000 rows. When the 1000 limit is reached, the first 200 rows are deleted to make room for the new data received (this is an approximation as only entire samples are deleted). The log file has no such limit and continues to be populated until monitoring is terminated.

- 5 Click on **Stop** to terminate the monitoring session.



#### NOTE

While monitoring is in process, you can continue the configuration of the Base Station/Micro Base Station, or switch to another Base Station/Micro Base Station. You can view the monitoring process by clicking on Monitor in the application bar. You can stop the monitoring session only when the relevant Base Station/Micro Base Station is selected. When a different Base Station/Micro Base Station is selected, the Stop button is deactivated. To terminate the monitoring session, you need to return to the Monitor Application with the Base Station being monitored selected.

## 4.3 Working with Log Files

BreezeLITE enables to export the sampled data to an external .csv file for backup purposes.



### To generate a Log file:

Check the Log check box. A Windows Save As window is displayed. A default file name for the .csv file is provided with the following format: <Base Station IP address> <Date YYMMDD>\_<Time HHMM>.

The .csv file is saved in a default location [in the designated LOGs > Monitor folder] and can be opened in MS Excel. While the file is open in excel, the data collected from the components cannot be updated into the .csv file. The data will appear on screen, but will not be recorded in the .csv file. Close the file to continue writing to the .csv file.



### To view a Log file:

Open the log file in MS Excel. You can also view the data using any standard text editor. The table with the recorded data is displayed.

Use the embedded add-in (**BreezeLITE** button in the toolbar) to organize the data in separate sheets (one for AUs and another for SUs).

Use the add-in (**Set Chart 'On'** button in the toolbar) to generate a graph according to the data gathered. You can change the chart's display using the sorting menus provided:

<i>Show</i>	You can display all sectors or only selected sectors, All SUs or a single SU.
<i>Sort By</i>	Changes the graphic display according to SU or Time.
<i>Left Axis</i>	Sets the left vertical axis to display a selected counter.
<i>Right Axis</i>	Sets the right vertical axis to display a selected counter.

When both left and right vertical axes are defined, two charts are generated.

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## Chapter 5 - Services Provisioning

### In This Chapter:

- “Service Definition Process” on page 92
- “Managing Service Components” on page 94
- “Managing QoS Profiles” on page 96
- “Managing Priority Classifiers” on page 98
- “Managing Forwarding Rules” on page 100
- “Managing Service Profiles” on page 103
- “Managing Subscribers” on page 106
- “Managing Services” on page 108
- “Service Summary Window” on page 113

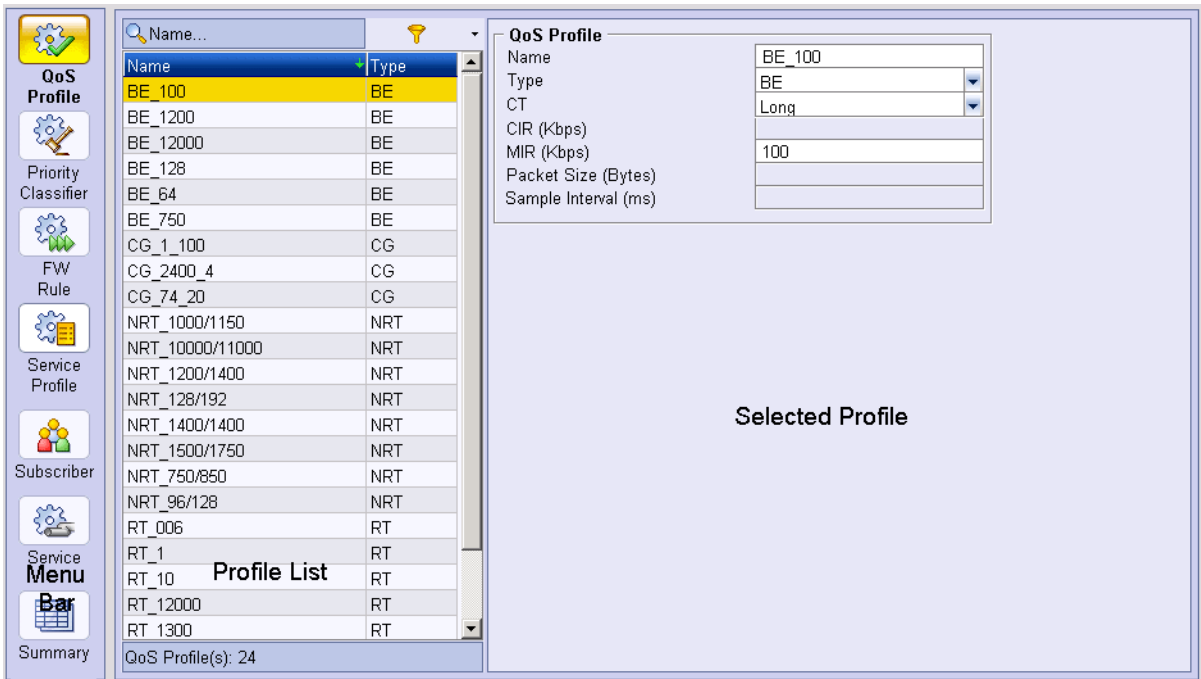
# 5.1 Accessing the Services Application

The *Services* application enables to define services, manage service components, and assign services to subscribers.



**To access the Services Application:**

- 1 In the BreezeLITE main window, select a Base Station from the list of Base Stations.
- 2 Click on the **Services** icon on the Application Bar. The *Services* window is displayed for the selected Base Station.



**Figure 5-1: Services Window**

In addition to the components detailed in [Section 1.2](#), the work area of the Services window includes the following components:

- **Menu Bar** - Includes the service components that comprise a service. Clicking on each service component displays in the work area the defined profiles. The menu button's background changes to yellow, indicating the selected service component.




- **Profile List:** Displays the list of the profiles defined for the selected service component, if any. Selecting an entry in the list highlights the entry and displays the profile in the Selected Profile area.
- **Selected Profile Area:** Displays the selected profile for the selected service component and enables to modify specific parameters. When adding a new profile to the Profile List, the Selected Profile Area displays an empty profile.

## 5.2 Service Definition Process

BreezeLITE enables to define, modify and manage services, where each service assigns certain service properties to a specific subscriber's application.

### 5.2.1 Defining New Services

A Service is made up of building blocks, located on the *Menu* bar. The process of defining completely new Services should be done “from bottom up”, as each building block in the process is defined using one or more “lower level” building blocks. Click on the **Map** button (  ) on the toolbar to view the provisioning map.



**To define a new Service “from scratch”:**

- 1 Define the QoS Profiles for the Priority Classifiers (Uplink/Downlink QoS Profiles) and for the required Forwarding Rules (Multicast QoS Profile). For more information on QoS Profile definition, refer to [Section 5.4](#).
- 2 Define the Priority Classifiers that should be available for the required Service Profiles. All QoS Profiles required for the Uplink/Downlink QoS profiles list must be defined in advance. For more information on Priority Classifiers definition, refer to [Section 5.5](#).
- 3 Define the Forwarding Rules that should be available for the required Service Profiles. The QoS Profiles required for the Multicast QoS Profile parameter must be defined in advance. To access the *Forwarding Rule Manager*, click on **FW Rule** on the *Menu Bar*. For more information on Forwarding Rule definition, refer to [Section 5.6](#).
- 4 Define the Service Profiles that should be available for the required Services. All required Priority Classifiers and Forwarding Rules must be defined in advance. To access the *Service Profile Manager*, click on **Service Profile** on the *Menu Bar*. For more information on Service Profile definition, refer to [Section 5.7](#).
- 5 Define the relevant Subscribers. To access the *Subscribers Manager*, click on **Subscriber** on the *Menu Bar*. For more information on Subscriber definition, refer to [Section 5.8](#).
- 6 Verify that all applicable SUs are defined.

- 7 Use existing Subscriber Name, SU MAC Address and Service Profile Name to define the required Service. To access the *Service Manager*, click on **Service** on the *Menu Bar*. For more information on Service definition, refer to [Section 5.9](#).

When there are various QoS Profiles, Priority Classifiers, Forwarding Rules, Service Profiles, Subscribers and SUs in the database, you can skip one or more of the steps 1 to 6.

## 5.3 Managing Service Components

Managing service components consists of adding new profiles and editing or deleting existing profiles. For details on each service component, see [Section 5.4](#) to [Section 5.9](#).

### 5.3.1 Adding a New Profile

- 1 Click on any of the service component on the *Menu* bar to display its manager window.
- 2 Click on **Add** on the toolbar. An empty profile is displayed.
- 3 Fill in the required parameters.
- 4 Click on **Apply** on the toolbar. The new item is displayed in the items list.



#### NOTE

The functionality of some of the fields displayed in the Selected Profile area may differ in the added empty profile. For example, a read-only field in the Selected Profile area may be a drop down list in the new profile.

### 5.3.2 Modifying a Profile



#### To edit an existing profile:

- 1 Click on any of the Service components on the menu bar to display its manager window.
- 2 Select an item from the list. The selected profile is displayed.
- 3 Edit the required parameters.
- 4 Click on **Apply** on the toolbar.



#### NOTE

Some of the fields are read-only and cannot be modified. You must delete the profile and add a New profile.

### 5.3.3 Deleting a Profile



**To delete a profile from a Service component:**


- 1 Click on any of the Service components on the menu bar to display its manager window.
- 2 Select a profile from the list.
- 3 Click on **Delete** on the toolbar. A confirmation message is displayed: Delete '<profile name>'?
- 4 Click **Yes** . The selected item is removed from the list.

### 5.3.4 Sorting the List of Profiles


The list of profiles can be sorted by Name or Type. To sort the list, click any of the column headers. The list is sorted in ascending order according to the selected column. Click the column header again to sort in descending order.

### 5.3.5 Finding a Profile by Name

You can search for a specific profile by name, by clicking on the search button

(  Name... ) and entering the profile's name.

### 5.3.6 Filters

You can filter the list of profiles by clicking on the Filter button (  ). Only the profiles matching the selected filter will be displayed.

## 5.4 Managing QoS Profiles

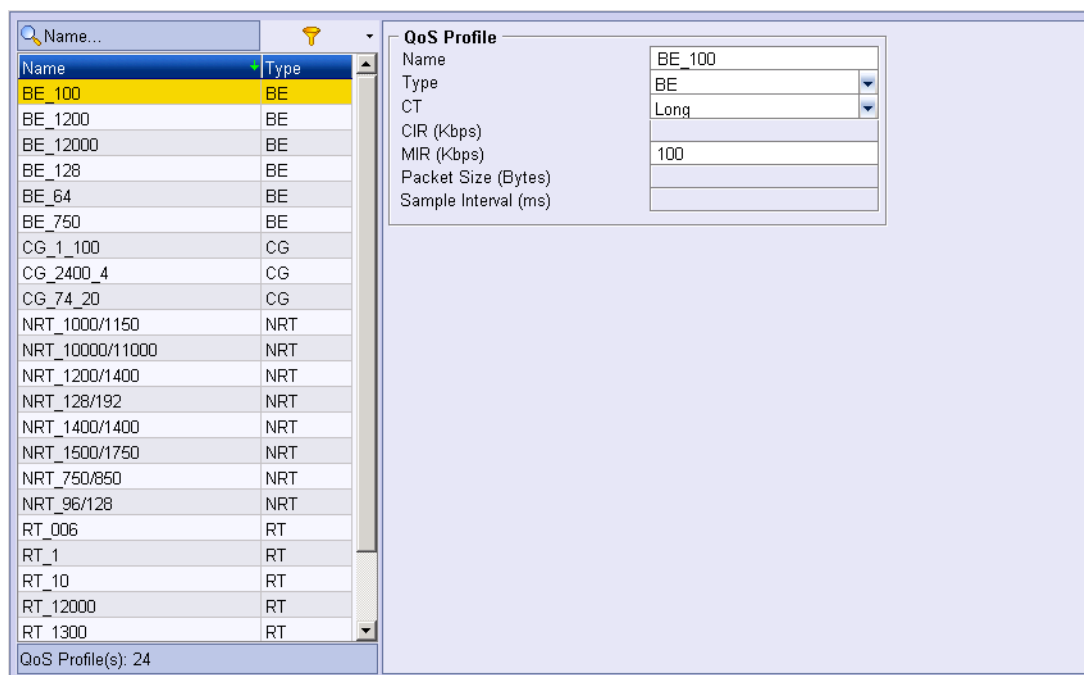
The *QoS Profile Manager* enables to:

- Define new QoS Profiles (see [Section 5.3.1](#))
- Edit the properties of QoS Profiles (see [Section 5.3.2](#))
- Delete QoS Profiles (see [Section 5.3.3](#)).



**To access the QoS Profile Manager window:**

Click on **QoS Profile** on the *Menu Bar*. The *QoS Profile Manager* window is displayed.



**Figure 5-2: QoS Profile Manager Window**

The Criteria Scheme for QoS Profiles includes filters with the following properties:

■ **Name:** The QoS Profile Name.

■ **Type:** The QoS Profile Type.

A QoS Profile includes the following components:

<i>Name</i>	A unique name of the QoS Profile. A string of up to 32 characters.
<i>Type</i>	Defines the QoS parameters that are applicable to the service. The available options are: CG (Continuous Grant), RT (Real Time), NRT (Non Real Time), BE (Best Effort)
<i>CT</i>	The Committed Time (CT) parameter defines the time window over which the information rate is averaged to ensure compliance with the CIR or MIR parameter. The available options are: Short, Medium, Long. The actual value in milliseconds for each of the three options varies according to the QoS type (refer to the <i>BreezeMAX System Manual</i> ). Configurable for RT, NRT and BE.
<i>CIR (Kbps)</i>	<p>The information transfer rate that the system is committed to transfer under normal conditions. The rate is averaged over a minimum increment of time, which is defined by the CT parameter.</p> <p>The range is from 0 to 12,000 Kbps (configurable for RT and NRT QoS types only).</p>
<i>MIR (Kbps)</i>	<p>The maximum information rate that the system will allow for the connection. The rate is averaged over a minimum increment of time, which is defined by the CT parameter.</p> <p>The range is from 1 to 12,000 Kbps (configurable for NRT and BE QoS types only).</p> <p>MIR cannot be lower than CIR (applicable to NRT QoS type).</p>
<i>Packet Size (Bytes)</i>	<p>The Packet Size parameter defines the amount of data in Bytes that is expected for each grant.</p> <p>This parameter is configurable for CG QoS type only.</p> <p>The range is from 64 to 1550.</p>
<i>Sample Interval (ms)</i>	<p>Defines the time in milliseconds between two successive grants (inter arrival time). Available for CG only.</p> <p>The range is from 5 to 100 in increments of 5.</p>

## 5.5 Managing Priority Classifiers

The *Priority Classifier Manager* enables to:

- Define new Priority Classifiers (see [Section 5.3.1](#))
- Edit the properties of Priority Classifiers (see [Section 5.3.2](#))
- Delete Priority Classifiers (see [Section 5.3.3](#)).



**To open the Priority Classifier Manager window:**

Click on **Priority Classifier** on the *Menu Bar*. The *Priority Classifier Manager* window is displayed.

Name	Type
1 POTS Advanced VoIP G.711	DSCP
1 POTS Advanced VoIP G.729	DSCP
1 POTS Basic VoIP G.711	DSCP
1 POTS Basic VoIP G.729	DSCP
BE Asymmetric	802.1P
Bronze Asymmetric	802.1P
Bronze Symmetric	802.1P
Gold Asymmetric	802.1P
Gold Symmetric	802.1P
New802Proba	802.1P
PC_BE_1	DSCP
Silver Asymmetric	802.1P
Silver Symmetric	802.1P

Policy Rule: 13

**Priority Classifier**

Name: 1 POTS Advanced VoIP G.711

Priority Type: DSCP

**Uplink Parameters**

QoS Profiles	Priority Limit
BE 64	0
RT 10	26
CG 1 100	63

**Downlink Parameters**

QoS Profiles	Priority Limit
BE 64	0
RT 10	26
CG 1 100	63

**Figure 5-3: Priority Classifier Manager Window**



The Criteria Scheme for Priority Classifiers includes filters with the following properties:

- **Name:** The Priority Classifiers Name.
- **Type:** The Priority Classifiers Type.

A Priority Classifier profile includes the following components:

#### Priority Classifier

<i>Name</i>	The unique name of the Priority Classifier. A string of up to 32 characters.
<i>Priority Type</i>	The Priority Type used by the Priority Classifier. When editing an existing Priority Classifier, this field is read-only (Priority Type of an existing Priority Classifier cannot be modified). The Available options are 802.1p and DSCP.

#### Uplink/Downlink Parameters

<i>QoS Profiles and Priority Limit</i>	<p>The Priority Limit parameters enable to define up to four limits, where a different QoS Profile can be assigned to each limit. The Priority Limit and assigned QoS Profiles are defined independently for the Uplink and Downlink, based on defining the Upper Limit for each Priority Range. Up to 4 Priority Limits (and the associated QoS Profiles) can be defined for each direction. A valid definition of Priority Limit must comply with the following rules:</p> <ul style="list-style-type: none"> <li>■ Each Upper Limit must be higher than its predecessor.</li> <li>■ The highest Upper Limit must be the highest value available for the applicable priority type (7 for 802.1p, 63 for DSCP).</li> </ul>
--	---

To define a Policy Limit when no prioritization is used, select DSCP as the Priority Type, define 63 as the first Upper Limit for both the Uplink and Downlink, and leave all other Upper Limits empty. Alternatively, you can select 802.1p and define 7 as the Upper Limit for both directions.

To associate a QoS Profile with each Priority Limit, select the QoS Profile from the drop-down menu.

# 5.6 Managing Forwarding Rules

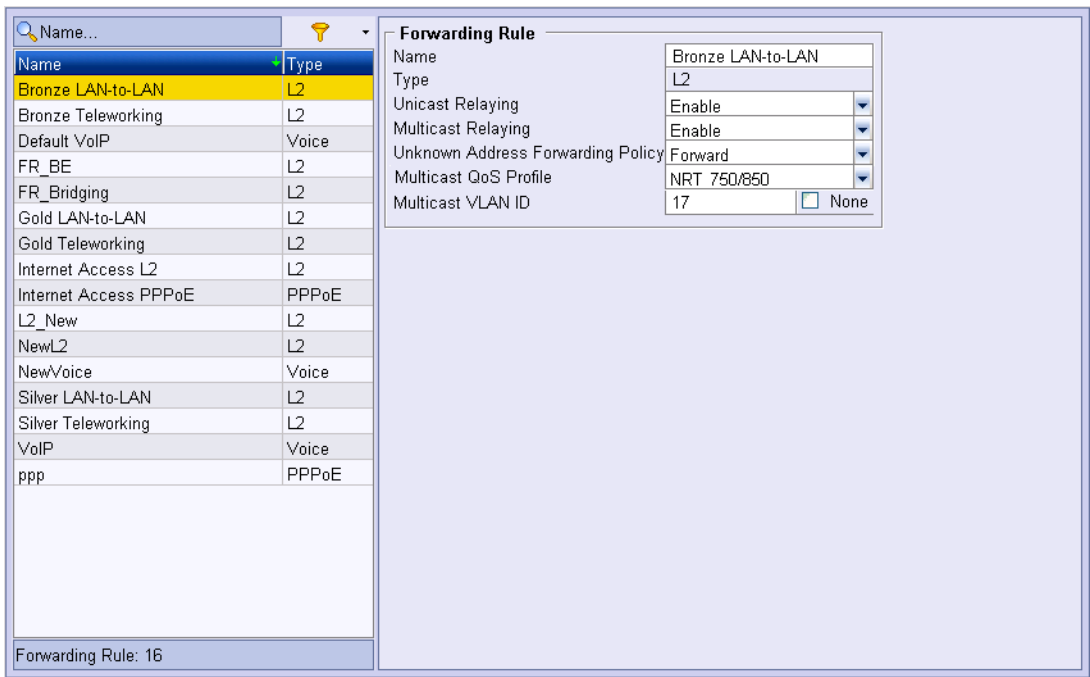
The *Forwarding Rule Manager* enables to:

- Define new Forwarding Rules (see [Section 5.3.1](#))
- Edit the properties of Forwarding Rules (see [Section 5.3.2](#))
- Delete Forwarding Rules (see [Section 5.3.3](#)).



**To open the Forwarding Rule Manager window:**

Click on **FW Rule** on the *Menu Bar*. The *Forwarding Rule Manager* window is displayed.



**Figure 5-4: Forwarding Rule Manager Window**

A Criteria Scheme for Forwarding Rules includes filters with the following properties:

- **Name:** The Forwarding rule Name.

■ **Type:** The Forwarding Rule Type.

A Forwarding Rule profile includes the following components:

<i>Name</i>	The unique name of the Forwarding Rule. A string of up to 32 characters.
<i>Type</i>	The Service Type. When editing an existing Forwarding Rule, this field is read-only (Service Type of an existing Forwarding Rule cannot be modified). For more information on Service types refer to the <i>BreezeMAX System Manual</i> .
<i>Unicast Relaying</i>	Applicable only for L2 and VoIP services. In PPPoE services unicast relaying is disabled by default. When disabled, unicast messages received by the Base Station/Micro Base Station from the wireless domain will not be relayed back to the wireless domain, even if their intended recipients are on the wireless side of the Base Station/Micro Base Station.
<i>Multicast Relaying</i>	Applicable only for L2 and VoIP services. In PPPoE services multicast relaying is disabled by default. Enables/disables relaying of multicast and broadcast messages. When disabled, multicast and broadcast messages received by the Base Station/Micro Base Station from the wireless domain will not be relayed back to the wireless domain, even if their intended recipients are on the wireless side of the Base Station/Micro Base Station.
<i>Unknown Address Forwarding Policy</i>	<p>Applicable only for L2 and VoIP services. In PPPoE services the unknown address forwarding policy is Forward by default. The following two options are available:</p> <ul style="list-style-type: none"><li>■ <b>Reject</b> - The AU/Micro Base Station will transmit packets only to those addresses known to exist on the wireless link side.</li><li>■ <b>Forward</b> - Enables the transmission of all packets, except those sent to addresses that the AU/Micro Base Station recognizes as being on its wired backbone side.</li></ul>

*Multicast VLAN ID*

The Multicast VLAN ID parameter is applicable only to Services assigned to SUs with SW version below 2.0. The Multicast VLAN ID is the VLAN ID to be attached to multicast messages in order to enable full support of the VLAN feature by SUs with SW version below 2.0.

In SUs with SW version below 2.0, it was necessary to use behind the SU a VLAN switch with binding capability to support multiple VLAN IDs. The VLAN switch was responsible for duplicating all the packets to the correct ports according to the multicast connection, this required switch pre-configuration. If a VLAN switch with binding capability was not used, only a single VLAN ID behind the SU could be supported, and this VLAN ID has to be identical to the multicast VLAN ID.

In the current version, all packets received from the wireless port over a multicast connection are transmitted by the SU several times to the Ethernet port, each time with a different VLAN ID, taken from the VLAN ID list supplied by the NPU/Micro Base Station.

Available values are in the range of 0 to 4094 or null (empty string) for No Multicast VLAN ID.

*Multicast QoS Profile*

The Multicast QoS is the QoS Profile for multicasts and broadcasts in the downlink. Select the QoS Profile from the drop-down menu. For further details on QoS profiles, see [Section 5.4](#).

## 5.7 Managing Service Profiles

The *Service Profile Manager* enables to:

- Define new Service Profiles (see [Section 5.3.1](#))
- Edit the properties of Service Profiles (see [Section 5.3.2](#))
- Delete Service Profiles (see [Section 5.3.3](#)).



**To open the Service Profile Manager window:**

Click on **Service Profile** on the *Menu Bar*. The *Service Profile Manager* window is displayed.

Name	Type
SP_BE_12000	L2
SP_PPPoE	PPPoE

Service Profile	
Name	SP_PPPoE
Type	PPPoE
VPL ID	200 <input type="checkbox"/> None
Forwarding Rule	FW_RT
Priority Classifier	PC_NRT_5000
Max. Number of Voice Calls	
Priority Marking Mode	Transparent
Priority Marking Value	
Transparent VLAN	Off

Service Profile: 2

**Figure 5-5: Service Profile Manager Window**

The Criteria Scheme for Service Profiles includes filters with the following properties:

■ **Name:** The Service Profile Name.

■ **Type:** The Service Profile Type.

A Service Profile includes the following components:

<i>Name</i>	The name of the Service Profile. A string of up to 32 characters. The Service Profile Name is unique per Serving Device.
<i>Type</i>	The Service Type. When editing an existing Service Profile, this field is read-only (service type of an existing Service Profile cannot be modified). For more information on Service types refer to the <i>BreezeMAX System Manual</i> .
<i>VPL ID</i>	The VPL ID to be used in the backbone domain. A number between 0 and 4094. A value of 4095 means No VPL ID. Select None for No VPL ID. For details on using VPL IDs refer to the <i>BreezeMAX System Manual</i> .
<i>Forwarding Rule</i>	The Forwarding Rule for the Service Profile, selectable from a drop-down menu. For further details on Forwarding Rules, see <a href="#">Section 5.6</a> .
<i>Priority Classifier</i>	Applicable only for L2 and PPPoE services. The Priority Classifier for the Service Profile selectable from a drop-down menu. For further details on Priority Classifiers, see <a href="#">Section 5.5</a> .
<i>Max. Number of Voice Calls</i>	Applicable only for L2 and VoIP services. The maximum number of simultaneous voice calls supported by the service.
<i>Priority Marking Mode</i>	The mode of marking data transmitted to the backbone network: Transparent, DSCP or 802.1p.
<i>Priority Marking Value</i>	<p>Not applicable if the selected Priority Marking Mode is Transparent. The marking value for data frames transmitted to the backbone, according to the configured Priority Marking Mode:</p> <p>DSCP: 0 - 63</p> <p>802.1p: 0 - 7.</p> <p>For more details on using Priority Marking refer to the <i>BreezeMAX System Manual</i>.</p>

*Transparent VLAN*

The VLAN Transparency Mode defines the method of transferring packets to the operator's upstream network. When set to On, data packets sent from the Base Station to the backbone will be transferred transparently. The VPL ID parameter is not applicable to Service Profiles with VLAN Transparency Mode On. Also The Forwarding Rule selection parameter is not applicable to transparent Service Profiles. All transparent Service Profiles share a single pre-configured Forwarding Rule, and a pre-configured QoS Profile for multicasts. The pre-configured Transparent Forwarding Rule can be modified but not deleted.

- For tagged packets, the VPL ID will be their VLAN tag.
- For untagged packets, the VPL ID will be None.

For packets received from the network, the forwarding decision will be according to the packet's VPL ID. If the VPL ID is unknown (either None or not included in the list of VPL IDs defined for any of the existing, non-transparent Service Profiles), the system will assume this is a transparent VLAN packet (if at least one transparent Service is defined) and transfer it with the original VLAN tag (or untagged if there is no VLAN tag).

When set to Off, data packets sent from the Base Station to the backbone will be transferred with a VLAN tag according to the VPL ID. The VLAN ID in tagged frames arriving from the wireless network will be replaced by the VPL ID. For packets received from the network, the forwarding decision will be according to the Forwarding Rule defined in the Service Profile with a matching VPL ID.

To avoid conflicts, a transparent Service Profile cannot be assigned to a Service if the Service's VLAN ID list includes a VLAN ID that is equal to any of the already assigned VPL IDs.

**NOTE**

Some of the parameters may not be applicable to all Service Types. In the *Add New Service Profile* window, the applicable parameters will be displayed only after selecting the Service Type.

## 5.8 Managing Subscribers

The *Subscriber Manager* enables to:

- Define new Subscribers (see [Section 5.3.1](#))
- Edit the Subscriber properties (see [Section 5.3.2](#))
- Delete Subscribers (see [Section 5.3.3](#)).



**To open the Subscriber Manager window:**

Click on **Subscriber** on the *Menu Bar*. The *Subscriber Manager* window is displayed.

Name (ID)	Status
Subscriber_1	Enable
Subscriber_2	Enable
Subscriber_3	Disable
Subscriber_4	Disable
Subscriber_5	Enable
Subscriber_6	Enable

Subscriber	
Name (ID)	Subscriber_1
First Name	John
Last Name	Smith
Admin Status	Enable
Description	Area_1

Subscriber: 6

**Figure 5-6: Subscriber Manager Window**



The Criteria Scheme for Subscribers includes filters with the following properties:

- **Name (ID):** The Subscriber's Name (ID).
- **Status:** The Administrative Status of the subscriber.

A Subscriber profile includes the following components:

<i>Name (ID)</i>	The Subscriber's Name (ID).
<i>First Name</i>	The first name of the Subscriber. An optional string of up to 32 characters.
<i>Last Name</i>	The last name of the Subscriber. An optional string of up to 32 characters.
<i>Admin Status</i>	Enables/Disables the administrative status of the Subscriber. If the Admin Status is disabled, the Subscriber will not receive any services.
<i>Description</i>	An optional informational string of up to 32 characters.

# 5.9 Managing Services

The *Service Manager* enables to:

- Define new Services (see [Section 5.3.1](#))
- Edit the properties of assigned Services (see [Section 5.3.2](#))
- Delete Subscriber's Service(s) (see [Section 5.3.3](#))
- View Down Link and Up Link Counters (see ).

## 5.9.1 Service Tab



To open the **Service Manager** window:

Click on **Service** on the *Menu Bar*. The *Service Manager* window is displayed.

Name	Type
SP_C1	L2
SP_E1	L2
SP_F21	PPPoE
SP_E10	PPPoE
SP_C11	L2

**Service** | Down Link Counters | Up Link Counters

Name: SP\_E10  
Subscriber Name (ID): Subscriber 1

**Service Profile**  
Name: SP PPPoE  
Type: PPPoE

**SU**  
Name: E10  
MAC: 0010E7E2046D

Admin Status: Enable  
Operational Status: Up  
Hybrid VLAN: On

Client Site VLAN List

#	VLAN ID
1	100
2	4095
3	
4	
5	

Service: 5

Figure 5-7: Service Manager Window

The Criteria Scheme for Services includes filters with the following properties:

■ **Name:** The Service Name.

■ **Type:** The Service Type.

A Service includes the following components:

Service	
<i>Name</i>	The service Name. A string of up to 32 characters.
<i>Subscriber Name (ID)</i>	The name (ID) of the Subscriber for which the Service is assigned.
Service Profile	
<i>Name</i>	The applicable Service Profile Name.
<i>Type</i>	A read-only display of the Service Type.
SU	
<i>Name</i>	A read-only display of the name of the SU name.
<i>MAC</i>	The MAC Address of the SU to which the Subscriber is connected.  This field is read-only when editing an existing Service if the Admin Status is enabled (SU MAC Address of an existing Service can be modified only if the Admin Status is set to Disable).
<i>Admin Status</i>	Enables/Disables the administrative status of the Service. If the Admin Status is disabled, the Service will not be available to the Subscriber.
<i>Operational Status</i>	A read-only display of the current operational status of the Service.
<i>Hybrid VLAN</i>	Hybrid VLAN Mode of operation enables classification of both tagged and untagged packets or untagged packets only, according to the rules in <a href="#">Table 5-1</a> .
<i>Client Site VLAN List</i>	A list of up to 16 VLAN IDs that are used as classifiers for the Service. If the list is empty, the VLAN ID will be ignored. For details on using VLAN IDs, refer to the <i>BreezeMAX System Manual</i> .

**Table 5-1: Hybrid VLAN Mode**

Hybrid VLAN Mode	VLAN List	Forwarded Packets
Off	Exists	Only packets tagged with a VLAN ID that exists in the VLAN List. VLAN List can include up to 16 entries.
	Empty	All (both untagged and tagged with any VLAN ID)

**Table 5-1: Hybrid VLAN Mode**

On	Exists	Untagged packets, and packets tagged with a VLAN ID that exists in the VLAN List. VLAN List can include up to 15 entries.
	Empty	Only untagged frames.

## 5.9.2 Down Link/Up Link Counters Tabs

The *Down Link* and *Up Link Counters* tabs display the counter information for the selected service.



QoS Parameters	1	2	3	4
Type	RT	BE	NRT	
CIR (kbps)/Packet Size (bytes)	6000		1	
MIR (kbps)/Sample Rate (msec)		2000	2000	

Counters	1	2	3	4
Bytes Request	0	0	0	
Bytes Tx	0	0	0	
Bytes Retransmitted Tx	0	0	0	
Bytes Dropped	0	0	0	
Bytes Discarded	0	0	0	
Pakets Req	0	0	0	
Pakets Tx	0	0	0	
Pakets Dropped	0	0	0	
Pakets Discarded	0	0	0	
Avarage Delay (msec)	0	0	0	
Delay Variance (msec²)	0	0	0	
Max Delay (msec)	0	0	0	
CIR Utilization (%)	0	0	0	
DLI (%)	0	0	0	
EIR Utilization (%)	0	0	0	
Average Throughput (bits/s)	0	0	0	

**Figure 5-8: Down Link/Up Link Counters**

For each downlink/uplink connection, the following information is displayed:

### QoS Parameters

<i>Type</i>	The QoS Profile Type used in the connection
<i>CIR (kbps)/Packet Size (bytes)</i>	The CIR (RT, NRT Services) or Packet Size (CG Service)
<i>MIR (kbps)/Sample Rate (msec)</i>	The MIR (BE, NRT Services) or Sample Rate (CG Service)



### Counters

<i>Bytes Request</i>	The number of bytes submitted by upper layers to this connection.
----------------------	---

<i>Bytes Tx</i>	The number of bytes transmitted to the wireless port through this connection, including retransmissions.
<i>Bytes Retransmitted</i>	The number of bytes retransmitted to the wireless port through this connection.
<i>Bytes Dropped</i>	The number of bytes dropped from this connection due to congestion in the wireless link. (identical to Bytes Discarded).
<i>Bytes Discarded</i>	The number of bytes discarded from this connection due to congestion in the wireless link. (identical to Bytes Dropped).
<i>Packets Req</i>	The number of packets submitted by upper layers to this connection.
<i>Packets Tx</i>	The number of packets transmitted to the wireless port through this connection, excluding retransmissions.
<i>Packets Dropped</i>	The number of packets dropped from this connection due to congestion in the wireless link. (identical to Packets Discarded).
<i>Packets Discarded</i>	The number of packets discarded from this connection due to congestion in the wireless link. (identical to Packets Dropped).
<i>Average Delay (msec)</i>	The average packet delay in milliseconds, measured for this connection over the last 15 seconds. The value is updated every 15 seconds.
<i>Delay Variance (msec<sup>2</sup>)</i>	The variance (the standard deviation squared) of the packet delay, in milliseconds squared, measured for this connection over the last 15 seconds. The value is updated every 15 seconds.
<i>Max Delay (msec)</i>	The maximum packet delay in milliseconds, measured for this connection over the last 15 seconds. The value is updated every 15 seconds.
<i>CIR Utilization (%)</i>	<p>The CIR utilization measured for an RT or NRT connection over the last 15 seconds. Not applicable for BE and CG connections.</p> <p><math>k = 100 \times (\text{the minimum between bytes transferred and CIR}) / \text{CIR}</math> is calculated for each 1 second interval. CIR Utilization equals the average of k over the last 15 seconds, and may vary from 0 to 100. The value is updated every 15 seconds.</p>
<i>DLI (%)</i>	<p>Data Loss Indicator: The percentage of dropped packets, out of the total demand, measured for this connection over the last 15 seconds. The value is updated every 15 seconds.</p> <p><math>\text{DLI (\%)} = 100 * (\text{Packets Dropped}) / (\text{Packets Submitted})</math></p>

<i>EIR Utilization (%)</i>	<p>Excess Information Rate utilization measured for a BE or NRT connection over the last 15 seconds. Not applicable for RT and CG connections.</p> <p><math>k=100 \times (\text{bytes transferred}-\text{CIR})/(\text{MIR}-\text{CIR})</math> is calculated for each 1 second interval. In BE CIR = 0. The EIR Utilization equals the average of k over the last 15 seconds, and may range from 0 to 100. The value is updated every 15 seconds.</p>
<i>Average Throughput (bits/sec)</i>	<p>The average throughput, in bits/second, measured for this connection over the last 15 seconds. The value is updated every 15 seconds.</p>

The *Down Link and Up Link Counters* tabs also includes the following buttons:

-  Refresh counters
-  Reset counters

## 5.10 Service Summary Window

The Service Summary window displays the details of all Services and associated Subscriber, SU, Service Profile, with a selected Serving Device (Base Station/Micro Base Station).



**To open the Service Summary window:**

Click on **Summary** on the *Menu Bar*. The *Service Summary* window is displayed.

Service	Subscriber ID	SU Name	SU MAC	Service Profile	Type	Status
<u>Service_001</u>	<u>New Sub</u>	SU-1	0010E722058C	First PPPoE	PPPoE	Down

Summary 1

**Figure 5-9: Service Summary Window**

The underlined entries in the summary table enable to view the summary window for the selected item (Service, Subscriber, Service Profile).



### NOTE

Clicking on the underlined entry opens a summary window. Some of the summary windows provide access to additional summary windows, such as Forwarding Rules and Priority Classifiers. Click **Yes** to close the summary window.







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## Chapter 6 - Filters



### In This Chapter:

- [“Accessing the Filters Application” on page 116](#)
- [“Filtering Definition Process” on page 118](#)

## 6.1 Accessing the Filters Application

The Filtering application allows a network operator to control the traffic in the system by forwarding or discarding packets according to a set of rules based on multiple allow/deny criteria. This provides both improved network security and better utilization of the wireless medium.

The filtering is done at the Base Station, controlling the traffic between the network and the wireless link. The filtering features enable:

- Filtering packets arriving from the network interface (From Network Filtering), using a set of either Layer 2 or Layer 3/Layer 4 Filtering Rules.
- Filtering packets arriving from the wireless link (From Wireless Filtering), using a set of either Layer 2 or Layer 3/Layer 4 Filtering Rules.
- Discarding packets to/from specific MAC addresses (MAC Address Deny List). This is applicable to MAC Addresses behind SUs.

The filtering functionality is described in [Figure 6-1](#).

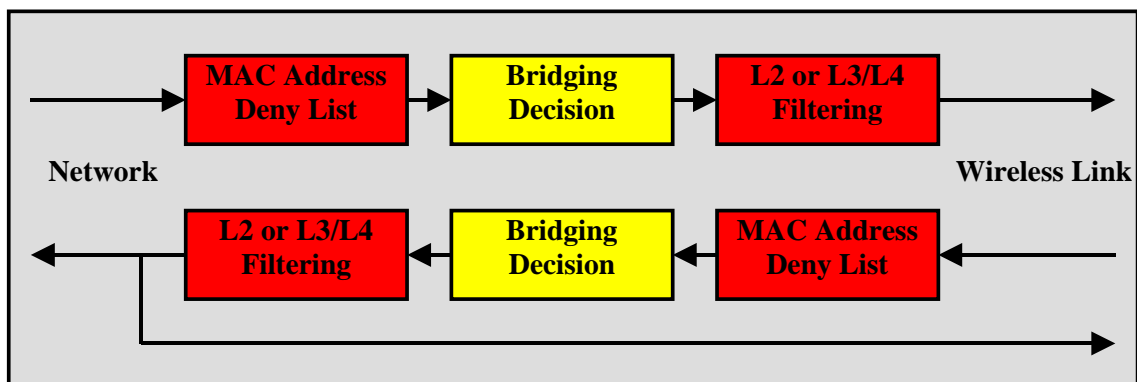
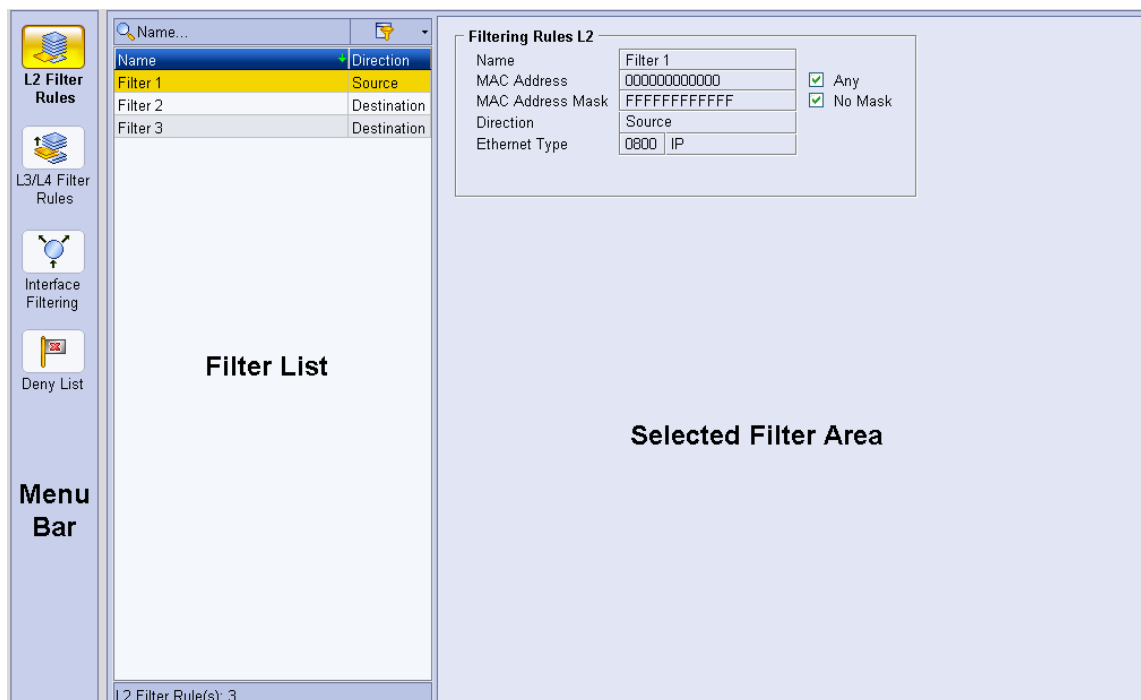


Figure 6-1: Filtering Functionality



### To access the Filters Application:

- 1 In the BreezeLITE main window, select a Base Station from the list of Base Stations.
- 2 Click on the **Filters** icon on the Application Bar. The *Filters* window is displayed for the selected Base Station.



**Figure 6-2: Filters Window (Modular Base Station)**

In addition to the components detailed in [Section 1.2](#), the work area of the Filters window includes the following components:

- **Menu Bar** - Includes the Filter components necessary for the filtering definition process. Clicking on each item on the menu displays in the work area the defined filters. The menu button's background changes to yellow, indicating the selected item.
- **Filter List**: Displays the list of the filters defined for the selected filter type, if any. Selecting an entry in the list highlights the entry and displays the filtering rules in the Selected Filter area.
- **Selected Filter Area**: Displays the selected filter and enables to view the parameters of the selected filter rule. When adding a new filter rule to the List, the Selected Filter Area displays an empty rule set.

## 6.2 Filtering Definition Process

The filtering definition process includes the following steps:

- 1 Defining list(s) of Filtering Rules. Each Filtering Rule defines a combination of values for certain packet fields. Filtering Rules can be of 2 types: Layer 2 Filtering Rules (using fields of the Ethernet frame) and Layer 3/Layer 4 Filtering Rules (using fields of the IP and/or UDP/TCP headers).
- 2 Associating each Interface (From Network, From Wireless Link) with a set of either Layer 2 or Layer 3/Layer 4 filters from the relevant Filtering Rules lists, and defining the action to be taken upon receiving a packet that matches any of the selected Filtering Rules: Allow (forward) or Deny (discard).

### 6.2.1 Defining Lists of Filtering Rules

The Filtering Rules windows enables defining L2 Filtering Rules and L3/L4 Filtering Rules.

#### 6.2.1.1 L2 Filtering Rules

An L2 (Layer 2) Filtering Rule includes the MAC Address and Ethertype. Either the Source MAC Address or Destination MAC Address can be defined. In Modular Base Station, a MAC Address Mask may also be configured, enabling to define a range of either source or destination addresses. (MAC Address Mask is not applicable for Micro Base Station). It is possible to define "Any" for either the MAC Address or Ethertype field (but not for both fields).

The database can hold up to 255 L2 Filtering Rules.



**To access the L2 Filter Rules menu:**

Click on **L2 Filter Rules** on the *Menu Bar*. The *L2 Filter Rules* window is displayed.

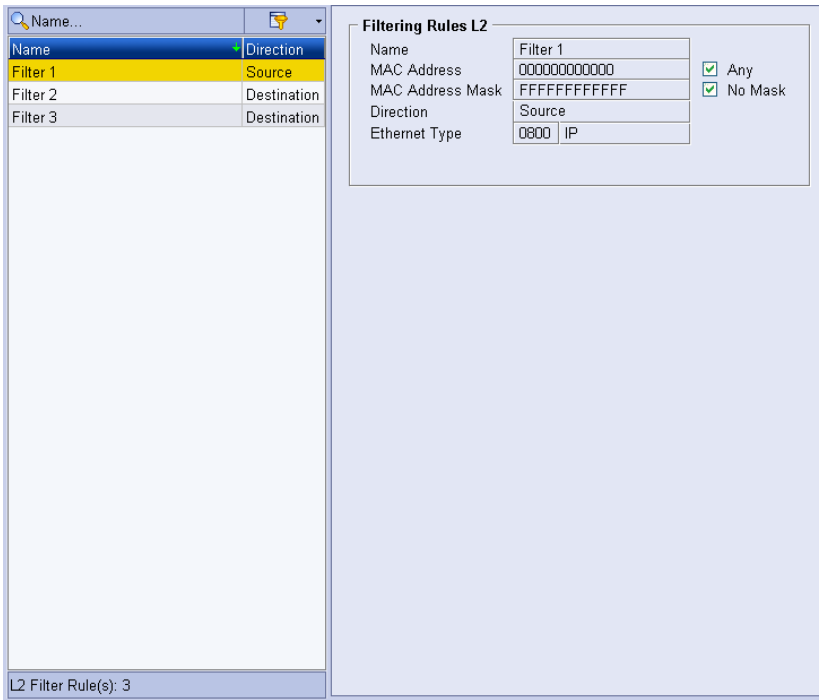


Figure 6-3: L2 Filter Rules Window (Modular Base Station)

The L2 Filter Rules window displays the following parameters for each filtering rule:

<i>Name</i>	The name of the L2 Rule. The L2 Rule Name is a string of 1 to 32 printable characters.
<i>MAC Address</i>	The base MAC Address that is used together with the MAC Address Mask to define a range of MAC addresses. A string of 6 octets (where each octet is represented by two hexadecimal numbers).
<i>MAC Address Mask</i>	Not applicable for a Micro Base Station. The mask that is used together with the MAC Address to define a range of MAC addresses. A string of 6 octets (where each octet is represented by two hexadecimal numbers). In a binary representation the string must comprise a series of contiguous binary '1's starting from the MSB, followed by a series of contiguous binary '0's (if the range includes more than a single address). The MAC Address Mask parameter is not applicable for an "Any" MAC Address.
<i>Any</i>	Check to select any MAC Address. An "Any" MAC Address means that the filter is defined only by the Ethertype field. When selected, the MAC Address Mask is not applicable.
<i>No Mask</i>	Check to select No Mask Address (a single address).

<i>Direction</i>	The direction (Source or Destination) of the MAC Address. Indicates whether the range defined by the MAC Address and MAC Address Mask is for the Source MAC Address field or the Destination MAC Address field in the Ethernet frame. The MAC Address Direction parameter is not applicable to "Any" MAC Address.
<i>Ethernet Type</i>	The Ethertype of the Ethernet frame. The Ethertype is defined by 4 hexadecimal digits. "Any" is applicable only if a MAC Address (or, in a Modular Base Base Station, a MAC Address range) is defined (the combination of "Any" for both the MAC Address and Ethertype is not allowed).

The *L2 Filter Rules* window enables defining new L2 Filtering Rule, viewing details of previously defined L2 Filtering Rules and removing L2 Filtering Rules from the database. It is not possible to edit the parameters of an existing L2 Filtering Rule.

#### 6.2.1.1.1 Adding a New Filter Rule

- 1 In the *L2 Filter Rules* window, click on **Add** on the toolbar. An empty rule set is displayed.
- 2 Fill in the required parameters.
- 3 Click on **Apply** on the toolbar. The new rule is displayed in the list.

#### 6.2.1.1.2 Deleting a Filter Rule



**To delete a filter rule:**

- 1 In the *L2 Filter Rules* window, select on a filter rule from the list.
- 2 Click on **Delete** on the toolbar. A confirmation message is displayed: Delete '<filter rule name>'?
- 3 Click **Yes** . The selected item is removed from the list.

#### 6.2.1.2 L3/L4 Filtering Rules

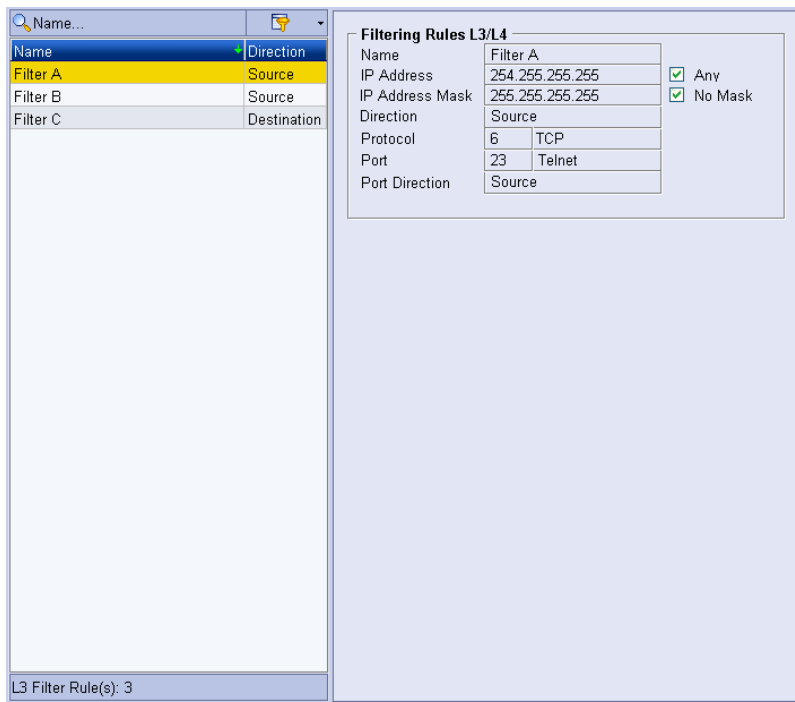
An L3/L4 (Layer 3/Layer 4) Filtering Rule includes the IP Address and Protocol. Either the Source IP Address or Destination IP Address can be defined. In Micro Base Station, the IP Address Direction parameter is not available. The direction is defined by the Port Direction parameter. In a Modular Base Station, an IP Address Mask may also be configured, enabling to define a range of either source or destination addresses. (IP Address Mask is not applicable to Micro Base Station). It is possible to define "Any" for either the IP Address or Protocol field (but not for both fields). If the specified Protocol is either TCP (6) or UDP (17), either the Source or Destination Port can be defined. It is also possible to define "Any" Port. In the Micro Base Station, only the TCP, UDP and Any options are applicable.

The database can hold up to 255 L3/L4 Filtering Rules.



**To access the L3/L4 Filter Rules:**

Click on **L3/L4 Filter Rules** on the *Menu Bar*. The *L3/L4 Filter Rules* window is displayed.



**Figure 6-4: L3/L4 Filter Rules Window (Modular Base Station)**

The *L3/L4 Filter Rules* window displays the following parameters for each filtering rule:

<i>Name</i>	The name of the L3/L4 Rule. The L3/L4 Rule Name is a string of 1 to 32 printable characters.
<i>IP Address</i>	The base IP Address that is used together with the IP Address Mask to define a range of IP addresses. A string of 4 decimal numbers (where each number is in the range from 1 to 255) . An "Any" IP Address means that the filter is defined only by the Protocol field (and optionally by the Port and Port Direction for UDP or TCP protocols).

<i>IP Address Mask</i>	Not applicable to Micro Base Station. The mask that is used together with the IP Address to define a range of IP addresses. A string of 4 decimal numbers (where each number is in the range from 1 to 255). In a binary representation, the string must comprise a series of contiguous binary '1's starting from the MSB, followed by a series of contiguous binary '0's (if the range includes more than a single address). The IP Address Mask parameter is not applicable to an "Any" IP Address.
<i>Any</i>	Check to select any IP Address. "Any" is applicable only if an IP Address range is defined (the combination of "Any" for both the IP Address and Protocol is not allowed).
<i>No Mask</i>	Check to select any IP Address Mask.
<i>Direction</i>	Not applicable to Micro Base Station. The direction (Source or Destination) of the IP Address. Indicates whether the range defined by the IP Address and IP Address Mask is for the Source IP Address field or the Destination IP Address field in the IP frame. The IP Address Direction parameter is not applicable to "Any" IP Address.
<i>Protocol</i>	The protocol of the IP frame. The Protocol is defined by a decimal number from 0 to 254 or 255 for "Any". In a Micro Base Station only the TCP (6), UDP (17) and Any (255) options are applicable.
<i>Port</i>	The TDP/UCP port number, which is applicable only if the Protocol parameter is configured to a value of either 6 (TCP) or 17 (UDP). The Port is defined by a number in the range from 0 to 65534.
<i>Port Direction</i>	The direction (Source or Destination) of the Port. Indicates whether the Port number is for the Source Port field or the Destination Port field in the IP frame. The Port Direction parameter is not applicable to "Any" Port. In a Micro Base Station, the Direction is applicable for both the Port and IP Address.

The *L3/L4 Filter Rules* window enables defining new L3/L4 Filtering Rule, viewing details of previously defined L3/L4 Filtering Rules and removing L3/L4 Filtering Rules from the database. It is not possible to edit the parameters of an existing L3/L4 Filtering Rule.

#### 6.2.1.2.1 Adding a New Filter Rule

- 1 In the *L3/L4 Filter Rules* window, click on **Add** on the toolbar. An empty rule set is displayed.
- 2 Fill in the required parameters.
- 3 Click on **Apply** on the toolbar. The new rule is displayed in the list.



### 6.2.1.2.2 Deleting a Filter Rule



To delete a filter rule:

- 1 In the *L3/L4 Filter Rules* window, select on a filter rule from the list.
- 2 Click on **Delete** on the toolbar. A confirmation message is displayed: Delete '<filter rule name>'?
- 3 Click **Yes** . The selected item is removed from the list.

## 6.2.2 Interface Filtering

The Interface Filtering menu enables viewing and editing the filtering mechanisms to be used on frames received from the network (From Network Filtering) and from the wireless link (From Wireless Filtering).

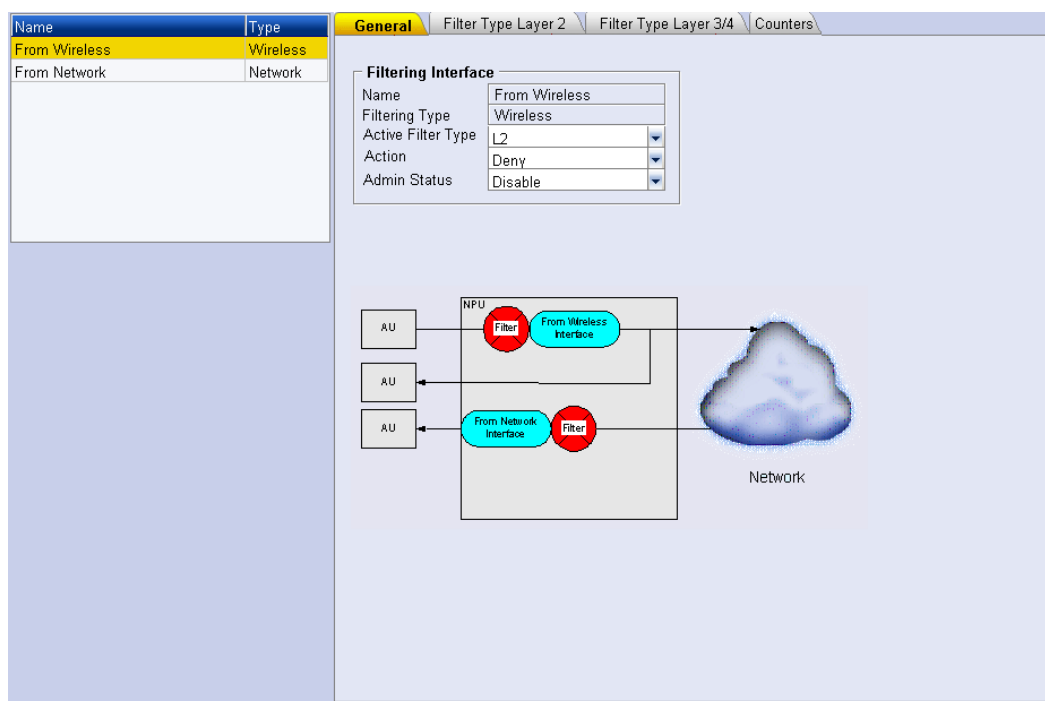


Figure 6-5: Interface Filtering Window

### 6.2.2.1 General Tab

The *General* tab enables associating each Interface (From Network, From Wireless link) with a set of either Layer 2 or Layer 3/Layer 4 filters from the relevant Filtering Rules lists, and defining the action to be taken upon receiving a packet

that matches any of the selected Filtering Rules: Allow (forward) or Deny (discard). It also enables to Enable/Disable each Interface.

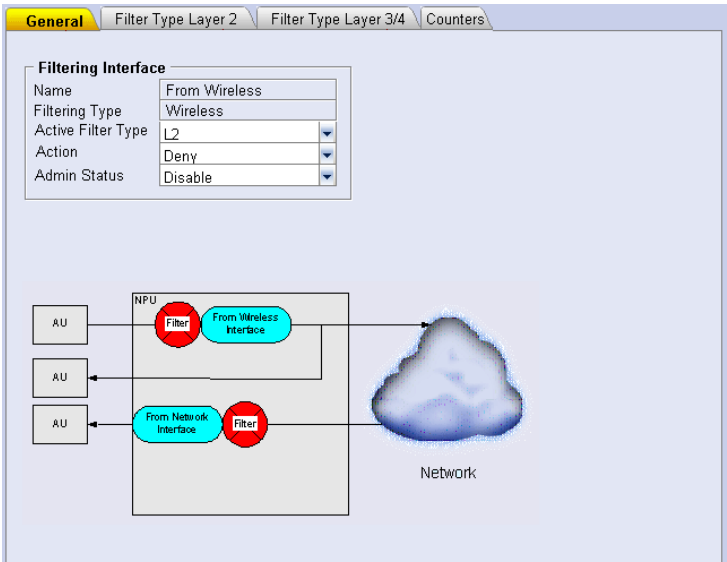


Figure 6-6: Interface Filtering General Tab

The *General* tab comprises the following parameters for each Interface (From Network, From Wireless link):

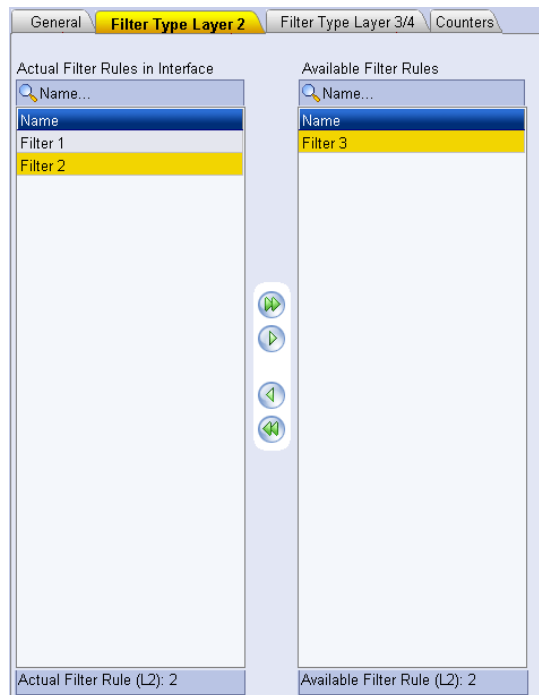
<i>Name</i>	A read-only display of the name of the selected Interface: <b>From Network, From Wireless.</b>
<i>Filtering Type</i>	A read only display of the filtering type: <b>Network, Wireless.</b>
<i>Active Filter Type</i>	<p>The Active Rule Type parameter defines which of the Filtering Rules List is used.</p> <p>The available options are Layer 2 and Layer 3/4.</p> <p>The default option is Layer 2.</p>

<i>Action</i>	<p>Defines the action to be taken for a frame matching any of the applicable Filtering Rules: Deny (discard) or Allow (forward).</p> <p>If the Action is Allow, all frames matching any of the applicable Filtering Rules will be forwarded, and all other frames will be discarded.</p> <p>If the Action is Deny, all frames matching any of the applicable Filtering Rules will be discarded, and all other frames will be forwarded.</p> <p>L3/L4 Filtering Rules are applicable only to IP packets. If the Default Action is Allow, non-IP packets will be forwarded although they do not match any of the applicable Forwarding Rules.</p> <p>The default option is Deny.</p>
<i>Admin Status</i>	<p>The Admin Status parameter defines whether the filtering mechanism is enabled or disabled for the selected interface.</p> <p>The default option is Disabled.</p>

The *General* tab also provides a graphic display of the filtering functionality.





#### **6.2.2.2 Filter Type Layer 2 Tab**

The *Filter Type Layer 2* tab enables viewing the L2 Filtering Rules assigned to the interface, adding Rules (from the list of Available Filter Rules) to the list of Rules assigned to the interface, and removing one or all Rules from the list of rules assigned to the interface.



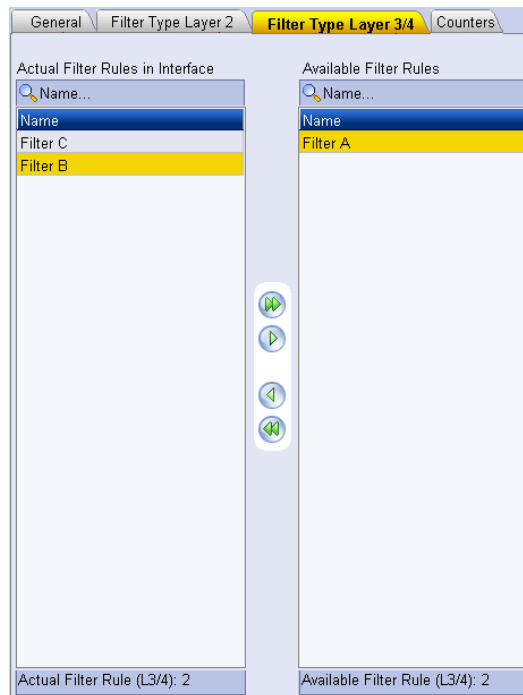
**Figure 6-7: Filter Type Layer 2 Tab**

Use the following buttons to move rules between lists:

-  Removes all L2 Filter Rules associated with the selected interface.
-  Removes only the selected L2 Filter Rule associated with the selected interface.
-  Associates only the selected L2 Rule from the list of available Filter Rules with the selected interface.
-  Associates all available L2 Filter Rules with the selected interface.





### 6.2.2.3 Filter Type Layer 3/4 Tab

The *Filter Type Layer 3/4* tab enables viewing the L3/L4 Filtering Rules assigned to the interface, adding Rules (from the list of Available Filter Rules) to the list of Rules assigned to the interface, and removing one or all Rules from the list of rules assigned to the interface.



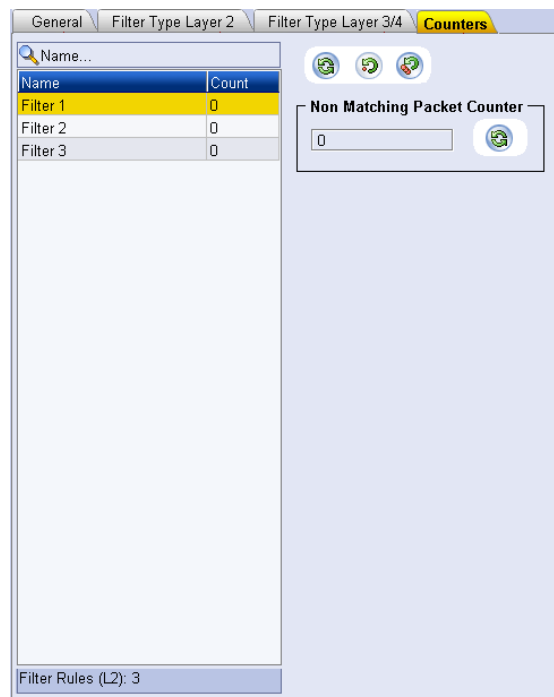
**Figure 6-8: Filter Type Layer 3/4 Tab**

Use the following buttons to move rules between lists:

-  Removes all L3/L4 Filter Rules associated with the selected interface.
-  Removes only the selected L3/L4 Filter Rule associated with the selected interface.
-  Associates only the selected L3/L4 Rule from the list of available Filter Rules with the selected interface.
-  Associates all available L3/L4 Filter Rules with the selected interface.

#### 6.2.2.4 Counters Tab

The *Counters* tab enables viewing and resetting the Filtering Rules Counters, which display for each of the applicable rules the number of frames matching the rule, accumulated since the last reset. In addition, there is a Non Matching counter, displaying the number of frames that did not match any of the relevant rules. The counters will be reset also after changing the Active Rule Type or disabling the Admin Status.



**Figure 6-9: Counters Tab**

The *Counters* tab also includes the following buttons:



Refresh counters



Reset selected counter



Reset all counters

#### NOTE



- Broadcasts and Management frames received from the network, whose destination is the NPU/Micro Base Station, are never filtered.
- ARP messages will be forwarded automatically if the following conditions are met:
  1. Active Rule Type is L3/L4.
  2. The L3/L4 Filtering Rules List includes at least one L4 Filtering Rule (a defined protocol).
  3. The Default Action is Allow.
 This is applicable to both interfaces.

### 6.2.3 Deny List

The *Deny List* window enables viewing and editing the Deny List. This list is used to deny services to MAC Addresses behind SUs. Uplink frames whose source MAC address matches any of the entries in the list and downlink frames whose destination MAC address matches any of the entries in the list will be discarded.

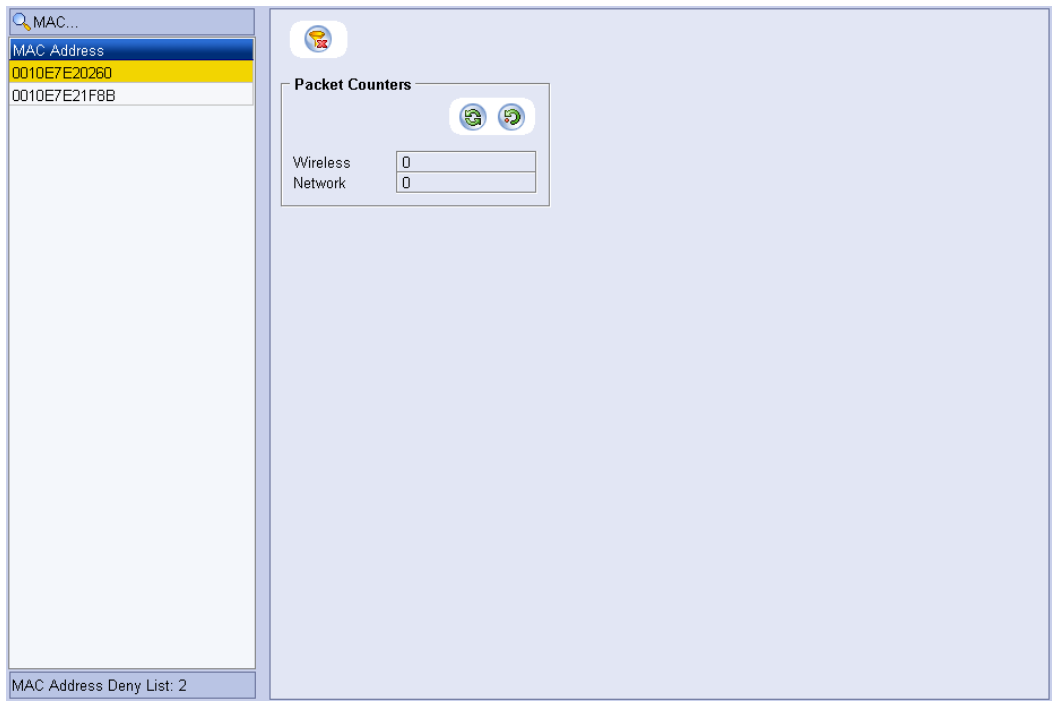





Figure 6-10: Deny List Window

The Deny List window also enables viewing and resetting the Deny List Counters, which display for each of the entries in the list the number of frames that were discarded because they match the entry, accumulated since the last reset.

-  Refresh counters
-  Reset counters
-  Remove all MAC Addresses

